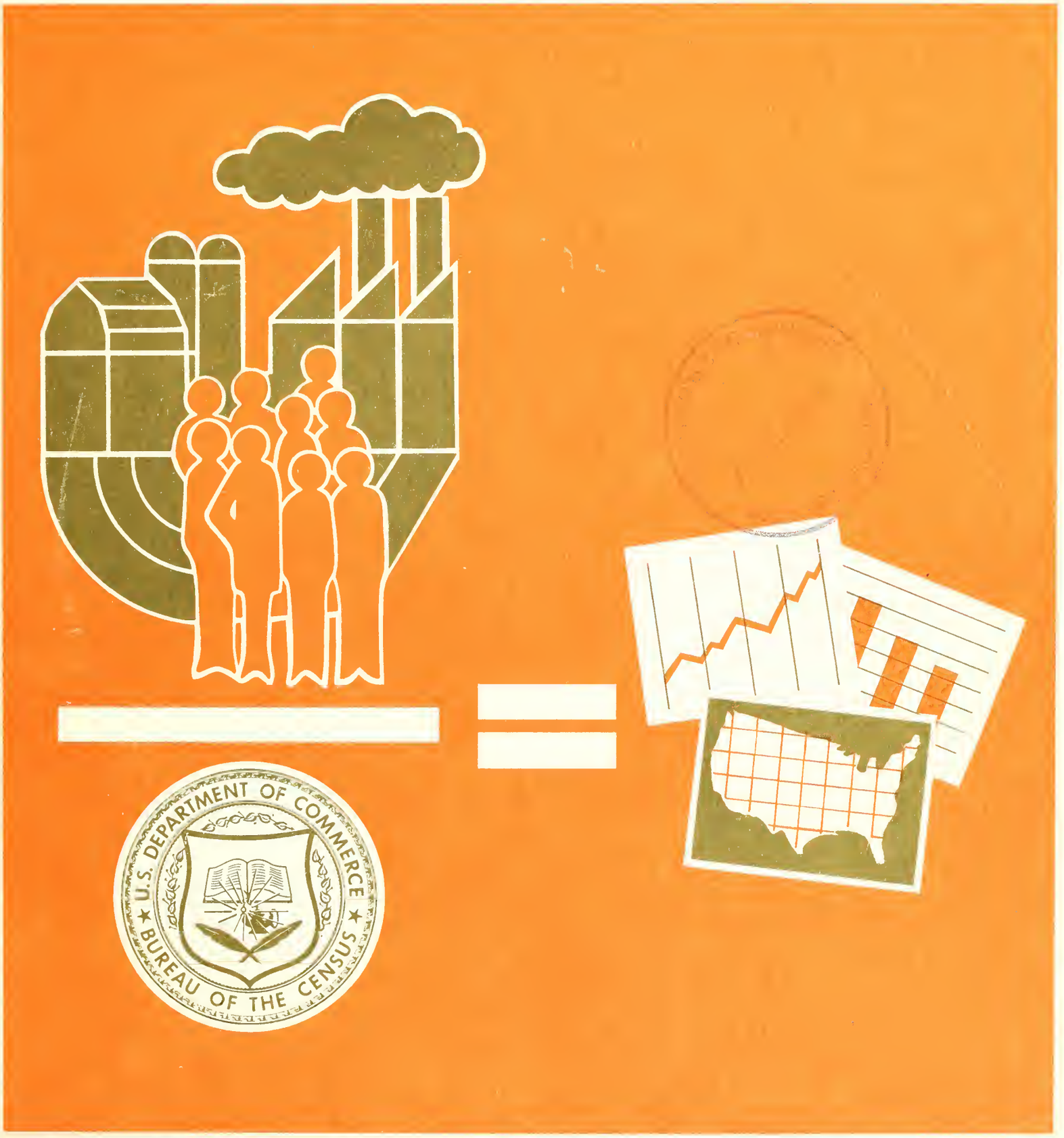
The Census Bureau
A NUMERATOR AND DENOMINATOR FOR MEASURING CHANGE

Technical Paper 37



U.S. DEPARTMENT OF COMMERCE

BUREAU OF THE CENSUS

Technical Paper 37

The Census Bureau

A NUMERATOR AND DENOMINATOR FOR MEASURING CHANGE

Issued June 1975

U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, Secretary
James L. Pate, Assistant Secretary for Economic Affairs
BUREAU OF THE CENSUS Vincent P. Barabba, Director

U. S. Depository Copy

BUREAU OF THE CENSUS

Vincent P. Barabba, Director
Robert L. Hagan, Deputy Director

ACKNOWLEDGMENTS

These seminar transcripts were edited and prepared by the Director's Office in cooperation with the Publications Services Division of the Social and Economic Statistics Administration. Within the Publications Services Division many individuals made significant contributions in the areas of publications planning and design, editorial review, composition and printing procurement. Jack L. Osborn, Administrative Assistant to the Director was responsible for planning and review of the material.

The cooperation of the University of Southern California School of Public Administration and Charles Grace, Director of its Program Development, as well as the government and private industry participants, is gratefully acknowledged.

Library of Congress Card No 75-619192

SUGGESTED CITATION

U.S. Bureau of the Census, **The Census Bureau, A Numerator and Denominator for Measuring Change,** Technical Paper 37, U.S. Government Printing Office, Washington, D.C. 1975

For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price $4.25.
Stock Number 003-024-01081-0

CONTENTS

	Page
Aspects of the Census Bureau — *Vincent P. Barabba*	1
Social Observatories. . .Through a Glass Less Darkly — *Vincent P. Barabba*	11
A Discussion of Privacy — *Vincent P. Barabba*	17
The Right of Privacy and the Need to Know — *Vincent P. Barabba*	23
Monitoring the Nation's Health — *Edward B. Perrin* and *Douglas Williams*	30
Measuring National Wealth and Well-Being — *Sidney L. Jones*	41
Profiles of Small Urban Area Change — *Richard Hanel*	53
The Role of Private Enterprise in Developing Indicators — *Richard Wirthlin*	77
The Graphic Presentation of Statistics — *Vincent P. Barabba*	89
The Census Function — *Daniel B. Levine*	104
Planning the Federal Statistical System—A Historical Perspective — *Joseph Duncan*	138
Commercial Use of Census Data — *Max Eveleth, Jr.*	151
The Evolution of Social Indicators — *Lee Preston*	159
Social Indicators for Corporate Management — *Lee Preston*	170
The Choice of Methodology in Social Problem Solving — *Harold Nisselson*	177
GBF/DIME System—The Diffusion of an Innovation — *Vincent P. Barabba*	189

Digitized by the Internet Archive
in 2012 with funding from
LYRASIS Members and Sloan Foundation

http://archive.org/details/censusbureaunume00unit

INTRODUCTION

The U.S. Census Bureau has been described in a variety of manners. It has been called "a data factory," "the largest statistical agency in the western world," "a Byzantine bureaucracy," "the greatest threat to individual liberties," and "one of the best brand names in America."

All of these phrases indicate that much like the fable of the blind man and the elephant one can discover a variety of "natures" in the activities and products of the Census Bureau.

From time to time individuals have attempted to describe aspects of the Census Bureau, and some have been more successful than others. This publication does not attempt to tell the Census Bureau's story, rather it is designed to discuss some of the roles that accurate and timely information can and should play in the making of meaningful decisions.

The format of this publication is quite simple. It is the result of 11 experts in the information and data processing fields talking about the uses and potential uses of information to 20 Masters and Ph.D. candidates at the University of Southern California's School of Public Administration.

These participants were a unique group of students, in that the vast majority were full-time employees of State and local government agencies or private industry. Most, if not all of the students were crucially involved with the day-to-day evaluation or dissemination of accurate and timely data in fields as varied as health care, law enforcement, and engineering. It was for this reason that the Bureau thought such a classroom format could produce the type of meaningful dialogue that all too often goes unrecorded, yet which reflects many of the concerns common to all users and suppliers of information. Because of this, the participants agreed that the student-faculty dialogues would be recorded, with the caveat that wherever the material could be made more meaningful, for the general reader, appropriate additions or deletions would be made.

With nearly one-third of the Federal Government's statistical dollars going to the Bureau, through direct appropriations or reimbursable work for other agencies, it was only natural that Bureau activities would play a central role in the discussion. Even so, there were times when the speakers referenced the Census Bureau only in passing, while at others the Bureau was the sole subject of the presentation. However, all the discussions have several points in common: 1) All the discussants have at one time or another had the responsibility of providing information to decisionmakers. 2) All the discussants have shared the frustration of not having their information used to its fullest extent. 3) All the discussants would like to see information used more extensively in the decisionmaking processes of our society. 4) All the discussants have used the Census Bureau as a denominator as they attempted to provide more meaningful measures to tell us "where we are and wither we are tending."

As the title of this publication indicates, the Census Bureau generates statistics that can serve as meaningful measures of societal change. In "Aspects of the Census Bureau" Vincent Barabba points out that these measures need not be complex and can be as simple as basic mathematics. It is a fact that some of the most meaningful statistical measures merely require the utilization of both a numerator and a denominator. The numerator will show the actual number of events that have occured, while the denominator shows the population within which the events could possibly occur. With this information analytical data can be developed to compare a variety of relevant factors. Almost everyone of the presentations addresses the problem of developing meaningful measures, whether it is in the corporate, marketing, health care, or national accounts fields. Today, the Census Bureau is involved, through its advisory committees, public meetings, and consultations with users, in attempting to understand and develop the statistical tools to present society's decisionmakers with appropriate measures. This publication is intended to reflect some of the current problems and trends in this effort, both within and outside the Bureau.

Because of the varied interests and expertise of the seminar participants there is not a natural flow from one presentation to another, just as the problems that the data providers and users face lack a natural flow from one to the next. An index of special ideas and topics is provided for those readers having specific interests. Thus, they will be able to rapidly locate relevant sections of the dialogues.

ASPECTS OF THE CENSUS BUREAU

Vincent P. Barabba, Director, U.S. Bureau of the Census

"As I have already suggested, instead of collecting everything, inundating the decisionmakers, and hoping that they can pick out the needed pieces, we should find ways of transmitting information effectively in more limited and usable formats."

Vincent Barabba

Mr. Barabba: As we begin this entire seminar I would like to present a brief theoretical discussion of the current and future cost and utilization of certain types of information. I hope to provide you with some criteria for judging the data systems, techniques, and usages that will be presented to you during this course.

To begin, it is self-evident that our country is entering a squeeze regarding the "margin of error" that both the governmental and private sectors will be allowed in conducting their affairs. The energy shortage indicates how narrow and ever decreasing this margin really is. We know that, viewed over time, business, manufacturing, and governmental decisions can have an irreversible ecological impact. Therefore, information that is sufficiently accurate, timely, and easy to use must be available so that the best decisions can be made to maximize the use of our limited resources.

There are real costs in both time and money associated with the collection of reliable and useful data, but from a societal perspective the cost of statistical information is closely related to the use. The relative cost to society of any data varies and is dependent on the number of times it is used. This assumes, of course, that we agree that society benefits when decisions relative to the utilization of its limited resources are based on accurate information.

The simple collection and publication of statistical data does not by itself fully meet the needs of today's decisionmakers, nor does the presentation of statistical data always maximize its potential uses. Even though society's decisionmakers are furnished with accurate, timely, complete, and usable data, it is a disservice if they and society are surrounded by too much data. Too much data places the user in the same plight as Coleridge's Ancient Mariner, who cried, "Water, water, everywhere, nor any drop to drink." It is necessary to find ways of reducing the current oceans of data into pools of meaningful information for decisionmaking.

To be truly useful, the data must be presented in a way which will achieve meaningful measures. Meaningful measures do not have to be complex. They can be as simple as basic mathematics. Some of the most meaningful statistical measures merely require the utilization of both a numerator and denominator.

The numerator shows the actual number of events that have occurred—for instance the number of births, deaths, or divorces; the number of whites, blacks, or persons of Spanish origin, the number of families with incomes under $5,000 or over $15,000, or other similar measures.

The denominator, on the other hand, will show the population within which the events can occur. The denominator may be the total population, the number of married women of childbearing age, the total number of families, or some similar population group.

For example, in health statistics it is important to know the number of people who die from a specified cause, such as cancer. The total number alone, the numerator, can provide useful information on the magnitude of occurrence of this disease. Additional understanding can be obtained by looking at the denominator. The denominator could be the total population, the total dying from all causes, or the total in one of the age, race, or sex groups. Knowing the denominator permits the development of analytical data showing the percent of the total population dying from this cause, the percent these deaths are of all deaths, the rates of occurrence for various population components and the changes in these rates.

Systems' Costs

In order to understand the potential contribution of statistical information and to compare the changing relative costs of collecting differing types of data, let us examine our current information systems by looking at three different ways we now generate statistical information. The first is through specific-purpose surveys that are designed especially for the problem to be explored. The second is through the use of a more comprehensive general-purpose survey or census. Rather than having a design intended to produce information on one particular problem, this type is constructed to provide insight into several areas of concern. The third method is through the synthesis and analysis of data already collected. The costs of these information system components vary greatly. The costs will change over time, and again, the cost per use will vary.

Figure 1 illustrates the change in relative costs for each use of information acquired through the collection of statistical data in a specific-purpose survey. The specific-purpose survey may include in its universe both the numerator and the denominator that are of primary interest to the decisionmaker. The costs of collecting this type of data have steadily increased over the past years and are likely to continue to rise in the foreseeable future. The measurement of specific actions, attitudes, or individual characteristics in relation to a particular problem or objective requires sample survey design, questionnaire development, the development and implementation of a collection methodology, and the utilization of analytical techniques.

Specific-purpose surveys may also be directed at an already identified population such as patients in hospitals, persons who have previously been identified as recipients of pensions, or similar unique universes. In some cases the population data collected in a general-purpose census can then be used as the denominator.

FIGURE 1. RELATIVE COST OF SPECIFIC PURPOSE DATA

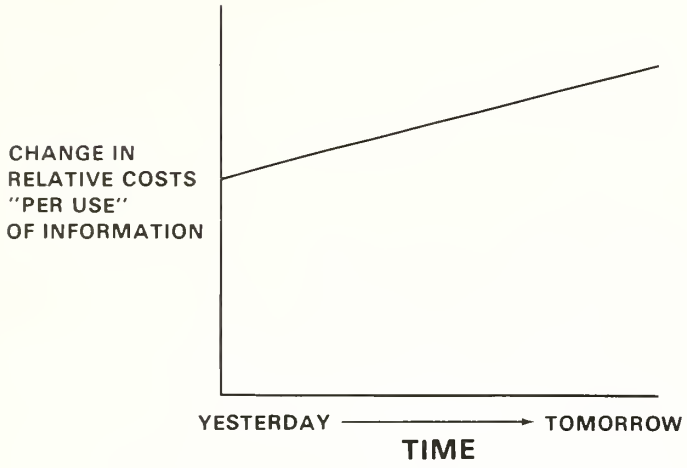
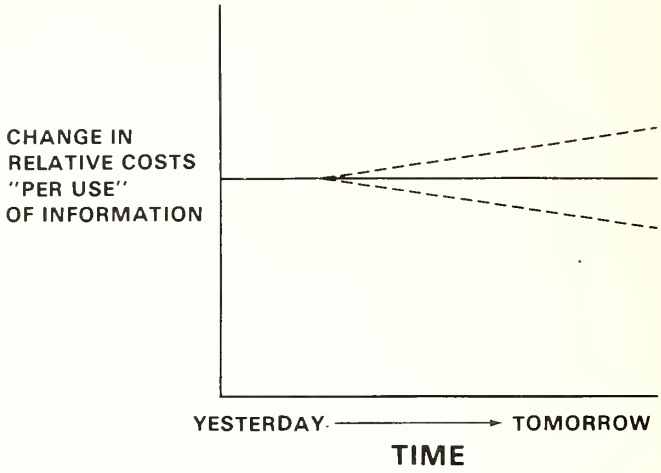


FIGURE 2. RELATIVE COST OF GENERAL PURPOSE DATA



Although extremely useful information can be obtained through specific-purpose surveys, and the cost is held down by sampling—they are often expensive undertakings. Survey costs will continue to increase due to the rising cost of labor, transportation, the use of more sophisticated and expensive methodologies, and the additional constraints that have been—and will be—placed on data-collection activities by the public's concern for individual privacy. One of the major reasons for the relatively high cost of specially collected data is that the information obtained cannot be used for other analysis and decisionmaking needs. A specific-purpose survey has, by definition, a narrow range of uses and the cost of generating the data is borne by a limited set of users. Unless a data set can be used for a variety of purposes, the cost to society remains the same as the cost and value to the original user.

This next chart (figure 2) provides an illustration of the relative "per use" cost of information collected in a general-purpose type of statistical system. Census data are a prime example of general-purpose statistics collected for a multitude of uses. General-purpose data can provide insight into a variety of specific problems through the use of proper comparison and extrapolation. General-purpose data provide benchmarks describing the general social or economic situation; they establish and define parameters and provide a vital time reference.

Costs related to the collection and analysis of general purpose data face the same pressures to increase that we find with specific data. But, as the frequency of use increases, the cost per each use is reduced. The collection of information in a decennial census which requires contact with every household in the Nation is, of course, an expensive undertaking. Census information is widely used by Congress, Federal, State, and local governments, businessmen, educators, and researchers. Many others are unaware that they use it, since census statistics are presented in a pervasive abundance in textbooks, almanacs, magazines, and newspapers.

These myriad uses make census statistics comparatively less expensive on a "per use" basis. The use of self-enumeration, whereby respondents receive and return the census questionnaire by mail, provides for lower collection costs and more accurate information.

Figure 2 tells us that if the ever increasing cost of collection placed on society is not offset by an increased number of uses per data item collected by society, the cost will continue to rise (upper line). However, if the increased number of uses is equal to the increase in cost, the cost remains equal to the per use cost of yesterday (solid line). If the increase in uses is greater than the increase in cost, the cost per use will fall below yesterday's cost (bottom line).

The Census Bureau's Current Population Survey is sometimes perceived as a specific-purpose survey. Each month some 50,000 households are interviewed for the very specific purpose of obtaining information on the magnitude of unemployment in the Nation. If this was the only information collected, and its use was limited to the statistics released by the Bureau of Labor Statistics, it would obviously be a limited-purpose survey. However, the CPS is used as a general-purpose survey to update, on a national basis, information collected in the decennial census on such matters as family income, educational attainment, school enrollment, marital status, households and families, migration, and similar subjects.

This ongoing survey also permits the addition of unique questions on such subjects as birth expectations and voter participation. Further analysis from annual average data as well as special tabulations from CPS data can be made.

The use of administrative records, available from Government and business, for the production of general-purpose, anonymous statistics is one of the factors which helps reduce the cost of data collection. The value of information from administrative records is considerable because the expense of collecting the information has already been allocated to other functions. These records—whether used by public officials in their planning efforts or by the business community—can be very valuable, particularly on the local level, through the use of the Census Bureau's geographic coding system, the GBF/DIME system. It is also the case that the hardware and software expenses of the GBF/DIME system have already been paid by research and development funds. Again, the greater the usage the lower the cost of each use.

One of the major assets of the GBF/DIME system is that it permits locally generated data to be related to census data, opening unlimited opportunities for the user. The numerator, in

this case, is the administrative records and the denominator, the census data.

However, I must point out that the effective use of masses of information involves certain drawbacks. Noteworthy is the question of confidentiality—an issue of great concern to Congress, the media, and the public. The Census Bureau has a legal obligation to protect the individual's right to privacy. This is based on Federal statute and long standing Bureau principle. The GBF/DIME system cannot provide confidentiality at the local level—only the actions and intent of those responsible can do that. However, the GBF/DIME system does allow specific characteristics to be assigned to a geographic area without revealing personal information about specific people who live there. The system has the merit of permitting any number of applications; from Federal to local and private areas there are uses which can be of immeasurable benefit to society.

For example, the GBF/DIME system permits a community to take its local files such as those relating to births, deaths, morbidity and health services—the numerators—and geocode them to census tracts or smaller areas, if necessary, where there is a population-at-risk. This can produce a wealth of information about every small area in the community, since the file contains the number of deaths and their causes, births, the number of health services, and the people who receive the services.

Once these local data are structured through an information system, they are useful in identifying populations which are most vulnerable to health problems. The health information system can also identify the specific needs of these people and recipients of services.

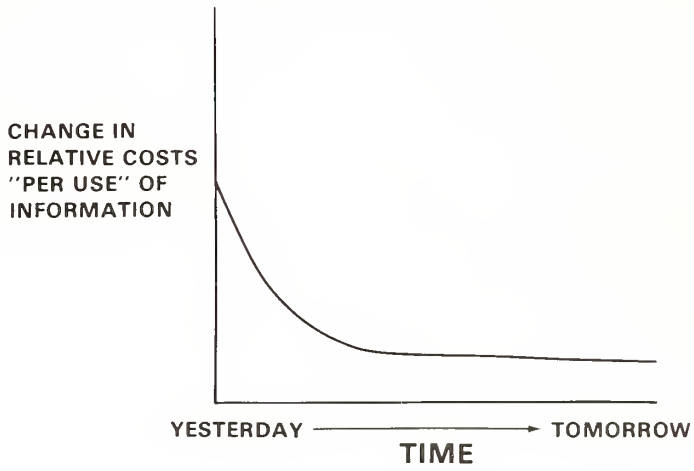
A very important factor in this system is that if these identifications are noted periodically, it is possible to monitor trends to determine if needs are being met, services delivered, or if other indications of quality health care are present. This ability to monitor health trends is particularly valuable in predicting the probable health conditions of those segments of the population most prone to poor health.

This chart (figure 3) illustrates the likelihood that the relative cost of analyzing data already collected may decrease in the future. One means of making greater analytical use of data already collected is through the increased application of computer capabilities. Computer capability has kept ahead of the increased costs of purchasing or renting computer systems. In addition, more qualified personnel are being trained to use this advanced equipment. While the generalized software packages have increased efficiency, access through remote terminals permits more people to use expensive main frames.

The further analysis and synthesis of information already collected also help provide some cost reduction by eliminating false starts and needless repetitions.

A tremendous amount of statistical information has been collected and published, and its further analysis can provide valuable information to serve the social and economic needs of our Nation. New mathematical techniques, such as model building, simulation, synthetic estimates, and path analysis can help provide more meaningful measures in the further analysis of previously collected material. Moreover, the further analysis and refinement of data, even when new mathematical techniques are not used, can still provide additional understanding. The presentation of newly computed rates and ratios and the selection of the most appropriate numerator and denominator can also help provide meaningful measures.

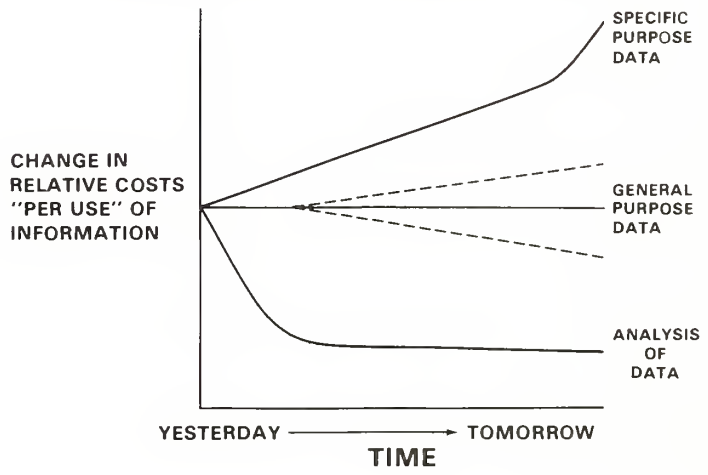
FIGURE 3. RELATIVE COST OF ANALYSIS OF AVAILABLE DATA



The message of this next chart (figure 4) is quite straightforward. It summarizes the three previous charts and clearly indicates that relative costs must be carefully considered. At some point in time, when the combined costs of general-purpose data and the further analysis of that data become sufficiently less than the cost of specific-purpose data, the decisionmaker may very well decide to use the less costly approach. He will, however, still need to give serious consideration to the quality, availability,[1] cost, timeliness, and respondent burden in determining the type of data to select.

Even though this chart may indicate some cost-benefit gains through the use of other types of data, specific-purpose surveys will continue to be conducted, for there will always be the need for unique information. This chart demonstrates that there will be several alternatives in the selection of information needed for decisionmaking processes.

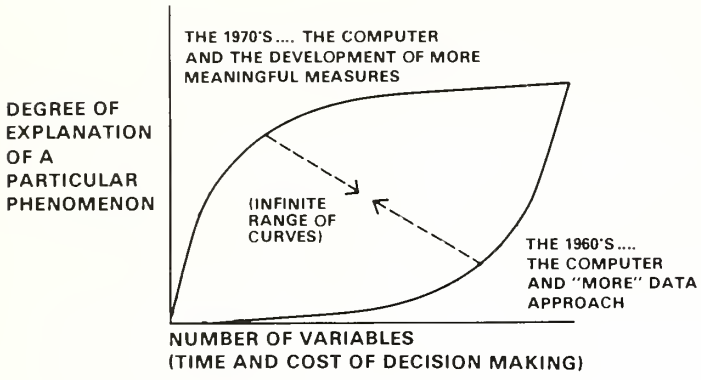
FIGURE 4. RELATIVE COST OF DATA



[1] Administrative records may be available and valuable as a resource, yet privacy and confidentiality rules or considerations may prohibit access.

The next chart (figure 5) illustrates the relationship between the degree of certainty a decisionmaker requires before he is willing to make a decision and how much that certainty will cost in time and money. The vertical axis measures the degree to which a particular phenomenon, circumstance, or experience can be explained. The horizontal axis measures the number of variables necessary to reach a particular degree of explanation.

FIGURE 5. DATA FOR THE DECISION MAKER


THE 1970'S.... THE COMPUTER AND THE DEVELOPMENT OF MORE MEANINGFUL MEASURES
DEGREE OF EXPLANATION OF A PARTICULAR PHENOMENON
(INFINITE RANGE OF CURVES)
THE 1960'S.... THE COMPUTER AND "MORE" DATA APPROACH
NUMBER OF VARIABLES (TIME AND COST OF DECISION MAKING)

During the 1960's most decisionmakers found their solutions in the enormous amount of data generated by the computer. This approach is typified by the lower curve, illustrating that many variables are required before a large degree of a particular phenomenon can be explained. This reflects the approach of "give me everything you can get on the subject."

However, one of the problems with this approach was the difficulty in using the reams of data that poured out of these very efficient data generators. This difficulty led to increased efforts to develop methodologies which would allow decisionmakers to deal with only the more relevant and meaningful variables. This latter approach is reflected in the upper curve, which illustrates that certain variables, properly calculated, can contribute to a greater degree of explanation. In a sense, the upper curve reflects an effort to turn the masses of data illustrated by the lower curve into information for decisionmaking. The development of economic indicators is an example of this.

In summary, there will continue to be specific-purpose surveys, but greater cost efficiency and public concern over privacy will cause the further growth and development of large-scale general-purpose surveys and the continued refinement and analysis of data already collected. The growing statistical needs of the Nation, such as the social and economic status of the population, and measures of our economic activity and natural resources, clearly indicate the vital need for the continued development of statistical information systems to meet the varied needs of both national and local decisionmakers.

Student: It seems one of the Census Bureau's major problems is the dissemination of the data collected. Is the cost of distributing this information prohibitive?

Mr. Barabba: There are cost problems, but they are not the major concerns. The problem is the disservice to decisionmakers by inundating them with too many facts. At best they've got to go through a whole roomful of facts to find the two or three they really need. If the providers of information have done a good job, they will have assessed and transmitted only the information needed for decisionmaking. But, that's a lot easier to say than to do, since most people don't know what they need, and it is often difficult to determine who users and potential users may be.

Student: By controlling or limiting what information is collected, you're making qualitative or quantitative judgments. These judgments can influence very directly the kind of decision that's going to be made. Is that a problem?

Mr. Barabba: It's a considerable problem, based on who's your most important constituent? Are the professors who are doing theoretical work, or local planners who may want specialized information emphasizing local data the Bureau's most important constituency? It's difficult to serve both users equally, because they want different kinds of information.

The professor is generally looking at national concerns because he's formulating theories. However, the city planner in Wichita Falls asks, "Why don't you take the census every other year, because I need detailed information about the blocks in my town?" With our limited budget we cannot satisfy both needs with ideal and exact service. So we attempt to compromise, and that's where the difficult part lies.

The Bureau spends, of its appropriated money and the work done for other people, over $130 million a year. That's a lot of money and a lot of information. But, we really don't have a good criterion to evaluate whether we're doing the best job for society, because society has not told us through its elected representatives what it really needs. In other words, it seems that the only time we learn what's really needed is when people complain that certain data don't exist. We use our advisory committees to a great extent, and they tend to cover the broad spectrum of information users. Then, too, Congress does a pretty good job by holding open hearings and asking us why we spend the money the way we do. Each Administration has certain things that it would like to accomplish. For example, the New Federalism has done more to create the need for local area data, and my ability to argue for more of it, than anything else. This is mainly because we've been able to make a case to the Office of Management and Budget that, besides giving these people their share of the dollar, the Federal government needs to provide the statistical tools to spend it wisely via an assessment of the program's impact.

For example, last year we had a small pilot program in San Francisco, Region 9, where we had two Census employees attached to the Federal Regional Council. Any time the council had an information problem these employees were available to bring together census and other data for them. They were there to help put together the information packages for various policy decisions.

This is a step in the right direction, because we are beginning to distribute specific information to those places where the decisions are being made. And we're not simply providing the national average income figures or the national crime rate, nor are we forcing officials in San Francisco or Boston to spend their dollars on the basis of these national estimates. To provide data sets to these various areas is a lot easier said than done. The raw data is available; the problem is providing the information in a retrievable format and understandable language.

As I have already suggested, instead of collecting everything, inundating decisionmakers, and hoping that they can pick out the needed pieces, we should find ways of transmitting information effectively in more limited and usable formats.

Student: You have implied that the types of data the Census Bureau produces have significance at several levels of use and, obviously, many of these potential uses have political implications. Unemployment would be a graphic example of that. Do you ever find instances where there's pressure put on you to either change the parameters of your criteria for categorization or to come up with some statistical results to validate a prejudice or a viewpoint, either from the executive or the congressional side?

Mr. Barabba: Never on the actual data.

Student: Interpretation, perhaps?

Mr. Barabba: First of all, and you'll have to take my word for this, any attempt to change actual numbers is virtually impossible. The reason it's impossible is that we do the collection and processing of the unemployment statistics in 15 days. Then, it would take collusion on the part of probably 120 civil service workers all the way from the supervisor in the field, through the regional director, and then through all the mathematical statisticians in the Census Bureau who deal with this particular survey. These figures are checked at various points aiong the way. Even if we could pull it off inside the Census Bureau, the figures have to go to the Bureau of Labor Statistics, which is an organization independent of the Census Bureau, and they have their own analytic techniques.

Student: You're saying that within your organization there isn't a problem. But how about externally, when somebody takes the data or suppresses its publication?

Mr. Barabba: There's a circular called OMB A-91 which describes the procedures for information release. Also, the Federal Register publishes a schedule of reports and the release dates. Finally, no Administration spokesman can speak about those statistics until an hour after they have been released to the press.

Student: Who decides, for instance, on the statistical description of poverty? One administration could possibly think that there's too much poverty in the United States and might decide to raise the figure on the poverty level. Who makes the ultimate decisions concerning what is measured, and the levels that represent "poverty" or other subjective states of being?

Mr. Barabba: Basically, the poverty line is a floating number tied to the Consumer Price Index (CPI). Poverty was benchmarked at a point in time and is now updated on the basis of what the Consumer Price Index is.

Student: I'm not as interested in the number or how it's used as in how the original benchmark is arrived at.

Mr. Barabba: Poverty statistics are based on a definition developed by the Social Security Administration in 1964 and revised by a Federal interagency committee in 1969.

Student: Does Congress have any input?

Mr. Barabba: You bet. Hearings. And legislation. If they are dissatisfied with a procedure, they can legislate how it should be done. If they can't get it that way, they always have something called the "budget." The budget is why departments and bureaus tend to be rather responsive to the Congress. The Congress can really affect your operations by delaying the signing of your budget, forcing you to work on a "continuing resolution" that basically says that you can't do anything that you didn't do during your last approved budget.

Student: How much time does Congress devote to supervising the Bureau? Do they depend on you for that information?

Mr. Barabba: Within the Post Office and Civil Service Committee of the House of Representatives there is a Census Oversight Subcommittee. It has a chairman and eight members. In the Senate it's the Post Office and Civil Service Committee, but it dosen't have a specific subcommittee looking over Census operations as such.

Sampling

Student: Who decides which households to survey and how is that decision arrived at?

Mr. Barabba: First, we use a probability sample. That means, when we start out, everybody in the defined universe has a known opportunity of being drawn into the sample. You have Mr. Morris Slonim's book on sampling. I don't want to get into a detailed discussion on probability sampling since you can find the treatment of this subject in a number of excellent texts. Let it suffice to say that the sample is randomly drawn, and appropriate field procedures are devised so that human intervention is reduced to a minimum, resulting in an estimate which has the least possible bias and sampling error consistent with the available resources.

Facetiously, if you don't believe in sampling, the next time you have your blood tested, have them take all of it. Because that's really what you're doing. You're taking a sample of something and you're assuming that it represents the total universe.

Now, how do we go about selecting a sample that will not be biased? The strength of the probability sample lies in the fact that we have no established quotas as to whom we will interview. That is, we let the laws of probability determine who will be interviewed rather than allow the interviewer to use his or her judgment in obtaining a specified number of interviews from designated subpopulations. Conceptually, the simplest way of doing this would be to have a list of everybody in the United States and give each of them a number; then draw the sample size desired from a list of random numbers, which is a list where the numbers have no relationship to each other. If information were collected properly from members of this sample you would be able to draw inferences about the universe of all people in the United States with a specified confidence. Since we will not be able to cover the elements of a course in probability sampling here, you must accept some of these principles on faith, unless you want to actually go out and select a sample. We can arrange that, too.

Student: If it's anything like precinct work, no.

Mr. Barabba: Precinct work, for a political party, would be an example of the worst kind of sampling for drawing inferences about the general population. The person you send out is a very partisan person who is going to people who generally hold similar beliefs. And, if the people don't, the worker is supposed to try to persuade them. But, we want to find people representative of the whole community and, for purposes of sampling, we don't care where they live; that's why we select them randomly. If we had to interview 10 people from a particular sampling unit, and we went right down the block and took them in sequence, we would have a biased sample. For example, all 10 might be found in one high-rise apartment; thus, no one else, for example those in single-dwelling units, would have a chance to come into the sample.

Here's another example of the type of problem that could arise. A survey was conducted in England and after they randomly selected street intersections they interviewed only those houses located on corner lots. Consequently, they ended with a sample of people who lived on the corners of the blocks. Now, in England as in the United States, the corner lot is usually the most expensive lot, so they had built an automatic bias into their sampling design. So, we have random procedures which force enumerators to interview specified households. Once they get to the door that's identified for them, their interview sheet specifies the person in the household to be interviewed. Depending upon the purpose of the study, this could be the oldest person, or the youngest, or one selected at random. There's a set of procedures for doing that as well, so that you don't have the interviewer talking only to people with whom she or he feels most comfortable.

Student: Well, where do you get the names—telephone books, voter registration, or people who have houses?

Mr. Barabba: Let me tell you how the Census Bureau does it. Let me use as an example the Current Population Survey, which is our largest and most comprehensive continuing survey.

If we had a complete and up-to-date list of addresses of all housing units in the United States, the problem of designating a sample of housing units could be approached as follows. We could count through the list and designate every 14 hundredth housing unit for the sample. If we counted through the entire list of roughly 70 million housing units, this process would designate a sample of about 50,000 units, very nearly the size of the current CPS.

The preceding, although very much oversimplified, illustrates the concept used at the Census Bureau to define the CPS household sample. As described, however, such a plan is not really economically feasible. In the first place, a sample selected in this way would require a visit to at least one sample unit in almost all of the 3,141 counties of the country and would require expensive field efforts for data collection. Secondly, the list of housing units for all areas of the United States would have to be developed and maintained, a very costly operation. However, if these efforts could be confined to a sample of primary areas, and if such a list were constructed within a subsample of smaller areas chosen out of these primary areas, the system becomes economically and practically feasible. This, in fact, is the system used by the Census Bureau.

To select the sample of primary areas, the entire United States is divided into primary areas called primary sampling units (PSU's). PSU's are designed for use as convenient interviewer assignment areas and at the same time to be efficient sampling areas for statistical purposes. We define a PSU as either an SMSA, a county, or a group of counties. A total of 1,924 PSU's have been designated in the CPS of the 50 States and the District of Columbia.

The second step involves setting up groups of PSU's called strata that are homogeneous with respect to the statistics we are primarily interested in collecting. In the case of the CPS, the grouping attempts to make PSU's within the strata homogeneous with respect to labor force data. The largest 156 PSU's (mostly SMSA's) were each made into a stratum; nearly 65 percent of the U.S. population resides in these strata. The remaining PSU's were grouped into 220 strata, each of which contained a number of PSU's whose population totaled about 350,000.

The sample of primary areas is then defined as all of the 156 largest PSU's plus a sample of one PSU from each of the 220 remaining strata. The PSU's are drawn from these latter strata with probabilities proportionate to their size, the larger the proportion of the stratum population contained in a PSU, the larger its probability of selection. An additional sample of 110 PSU's was drawn from half of the 220 strata, making a total of 330 PSU's selected from the 220 strata. Because it is possible for a PSU originally selected out of one of the 220 strata to appear again in the second sample, there are a total of 461 different PSU's in the sample (including the 156 large PSU's). These sample PSU's comprise a total of 923 counties (about 76 percent of the total U.S. population).

Within each of these sample PSU's, a sample of smaller areas, called enumeration districts (ED's) is selected, and it is within these ED's that the current register of housing units is needed. The register is made up from three types of lists: Units enumerated in the 1970 Decennial Census, units missed in the 1970 Decennial Census, and units constructed since the 1970 census. A record of units enumerated in the last census is available for sampling in all areas of the country including the sample of ED's in the 461 areas designated above.

Units constructed since the census are measured by two methods. For most of the United States (covering about 87 percent of the construction), a building permit is required by a local civil jurisdiction, and the Census Bureau visits a sample of these jurisdictions to select a sample of the new units represented by the permits issued. For the balance of the United States, new construction is measured by a sample of small land area segments within which the existing units are canvassed to identify those built since the census. For some ED's, where records of units enumerated in the census have incomplete address information (incomplete street name and house or apartment number), the sample of land areas is used also to represent units enumerated in the census rather than the sample drawn from the incomplete list.

Units missed in the 1970 census are represented by a sample of small land areas. Just after the census, an intensive canvass of units in these segments and a match against units recorded in the census were made to identify units which should have been enumerated in the census but were not.

The lists are used to designate a random sample of units for interview by a set of rigid mechanical steps which do not allow subjective judgment, personal choice, or convenience of obtaining an interview to enter the selection process. The procedure maintains the concept of counting through all units of the United

States by varying the counting intervals to insure a constant probability of selection for each unit.

You have two main categories of error from surveys. They are usually designated merely as sampling and nonsampling errors. Sampling error arises because the estimate from an individual sample is not the same as the average of all possible samples. If the sample is drawn with known probability, and if the survey is carried out properly, there is a well-known body of theory which permits you to estimate this sampling error. Given the sampling error, it is possible to make inferences about the estimates with specified confidence. For example, two sampling errors above and below the estimate give an approximate 95-percent confidence interval. What this means is that if 100 samples were taken and 95-percent confidence limits constructed on each sample, approximately 95 of them would include the average (but unknown) value of all possible samples and 5 of them would not include this average value.

Nonsampling error, which includes bias, is much more difficult to measure, and the theory for estimating the components of nonsampling error is not as well developed as it is for estimating sampling errors. Nonsampling errors can never be eliminated. They occur in the way a question is asked, the time of day the interview occurs, and the characteristics of the respondent and the interviewer. In some cases you can get a measure of the influence of age of interviewer, for example, by assigning respondents at random to interviewers of different ages and estimating the difference in response by age class. If you are talking about variables such as income, you must go to more elaborate procedures like auditing a random subsample of respondents, provided you can get them to agree to an audit.

Regarding General Response

Student: Are you having any trouble getting people to respond to Bureau surveys? I have read that private polling organizations are encountering more and more resistance.

Mr. Barabba: Our Current Population Survey is a good indicator of whether we have a problem, because in this survey we interview some 50,000 households every month. It's a voluntary survey. Less than 2 percent of the people contacted refuse to participate in the survey. That figure has remained fairly stable through all the political problems of the recent years. It has cost us a little bit more time at the door, two or three more callbacks, and more intensive followup procedures to maintain that level.

Student: Are there any other surveys demanding public response besides the decennial census?

Mr. Barabba: Any Bureau survey conducted more than once a year is voluntary. All our economic census activity and the census of agriculture are mandated surveys, the responses to which are mandatory.

Student: Do you ever pay anybody or offer them a free gift to respond?

Mr. Barabba: Oh, no; although, as a matter of fact, there was a study called the Consumer Expenditure Survey in which one filled out a diary and was then interviewed quarterly. It took about 2 hours every time you were interviewed. We experimented, on a pilot basis, with paying people to fill out the diary and there was no appreciable difference in the response rate. However, commercial interview firms have used that approach successfully.

What you have going for you in the polling and survey business, in the Government and nongovernment research as well, is that people are not normally given the opportunity to express their opinions. I can recall that my wife never believed that I had a real job until she was interviewed. She'd always said nobody would ever answer our questions, and yet she found herself answering, mainly because it was interesting, and no one had ever asked her opinion before.

Student: Does the reliance upon mailed-in questionnaires rather than personal interviews mitigate against obtaining responses?

Mr. Barabba: In the census, about 87 percent of the people who received their questionnaires by mail sent them right back. That figure says that we only had followup on 13 percent of that population. We were able to take our resources and, in a sense, segment the population: Those who were easy to get the information from and those who were more difficult. Then we focused on the balance.

One of the crucial aspects of the door-to-door technique is the enumerator could be somebody from your neighborhood, and you might be more hesitant to answer the questions. Through the mail-out method, you can fill out your questionnaire in the privacy of your home, put it in a confidential envelope, and mail it back to the Census Bureau. There are a lot of advantages to the mail-out/mail-back format.

Student: Do you have a followup to cross-check the mail-back responses?

Mr. Barabba: There's a whole series of evaluations on the 1970 census which are in the process of being published. Many of these evaluations cover the extent to which different items bias the response. I think Mr. Levine could deal with those more effectively.

Student: Has anyone actually been prosecuted for giving false information?

Mr. Barabba: Not false information, no. There have been very few prosecutions; but when there is, it is someone who will not fill out the form.

Student: Oh, you really will prosecute?

Mr. Barabba: Oh, yes, we have to. If we let nonresponse become a way of life, there could be a real problem. However, we normally don't go after a person until he says, "Now, look here, my fellow Americans, I told those Bureau snoopers to go jump in a lake and you should tell them to do the same thing." We have to deal with that. If our data are not accurate the whole base of the entire Federal statistical information system is also inaccurate.

Student: What do you do about mobile people?

Mr. Barabba: We have a couple of problems when it comes to people who aren't counted that are quite distinct. They arise

when people are not counted because they are not available, or because they don't want to be counted.

Now, when they are not available, the Bureau will continually attempt to contact a household until somebody answers the door. Let's say somebody's on a 3-month vacation. After so many times of knocking on the door, we'll go to the next door neighbor and ask how many people live in that house. Then we will record only that information, plus a few basic characteristics. We'll also determine whether it's a single-family dwelling unit.

If we can't get answers to the question, we'll impute information for that unit by replicating the data for an enumerated unit. We substitute the characteristics for the previously processed unit. Understand that imputation amounts to an infinitesimal number so that the impact on the total census is minimal.

Minority Undercount

Student: For specific groups, I understand that your count was pretty far off. For the lower income groups there's been a lot of publicity that your procedures are severely biased.

Mr. Barabba: I'll give you my very famous speech on the undercount. First of all, I should point out that the U.S. Census Bureau—not that we're defensive or anything—not only admits that it made a mistake, but quite precisely estimates the extent to which it erred. That undercount number that everybody talks about was provided by the U.S. Census Bureau for evaluative purposes.

There are several ways of estimating the undercount, and you have to remember it's an estimate. However, we feel, given the mail-out/mail-back approach to the census in urban areas, that we hit almost every household. But, if there are five people living in a household—really living in a household—and we only counted four, that's very difficult for us to deal with, particularly if the fifth person doesn't want to be counted.

Those of you who are involved in welfare activities realize that it is in some individuals' vested interests not to be identified with a particular household, as otherwise their welfare payments would be cut off. Those of you in law enforcement realize that for an illegal alien it is not in his best interest to be identified at all. These types of individuals have not had an opportunity to read "Privacy and the Need to Know," and therefore they do not understand that such information will not get in the hands of any other agency of Government.

There is another kind of disclosure problem that also may affect people. Let's say there is a rule in a public housing unit that you can have no more than six people per apartment. We came along and, in counting the apartment occupants, the numbers that we record may show that some apartments are in excess of the rule. Let's say this apartment complex was an entire block. We do generate block statistics. The manager could go down the block statistics and determine that there was an excess of people living in his apartments. At that point we have released information that some would argue is of detriment to those individuals who are violating the rules. We have not given away which apartments they were. Nobody can get their hands on that. And we may not have known that there even was a rule. But we certainly have made the violators more vulnerable to discovery.

Therefore, one of the precautions we take to lessen the chances of this sort of thing happening is to have a disclosure rule. The rule is that if there are so few people living in an area that you could, from inference, determine the characteristics of an individual or housing unit, we will suppress that number or limit it to being released in a much larger context which makes it virtually impossible to identify anyone.

Remember, there is no way that the U.S. Census Bureau, without abrogating all the traditions of our society, can force a person to tell us how many people are living there, if for no other reason than it would affect the reputation we have with all these other people.

Also, remember that I told you that we prepare an estimate of the population for evaluative purposes. In 1970 we believe that the undercount amounted to about 2.5 percent of the total population. We develop the undercount estimates for various population groups (i.e., by age, race, and sex) by taking all the available independent sources of information such as births, deaths, immigration, emigration, Medicare statistics, and the like, and estimating what the population ought to be.

You may say, "Why, if you can do that, do you bother to take the census at all?" The answer is simple. We can only tell you about the United States as a whole, and we can't tell you about Orange County, Calif. That is why we have to take the census. Besides, I can't tell you what the income is and can't tell you all those other important things.

The Census Bureau has to educate the public that they will not be hurt by giving us correct numbers. In fact, they are hurt more if they don't give us the numbers, because these people are not represented in revenue sharing calculations. They're eliminated from the concept of equal elected representation. That is the constitutional reason we take the census—to apportion the House of Representatives equally and fairly among all people.

To help deal with undercount problems we are establishing two committees. While the undercount is 2.5 percent among all people, nationwide among black people the estimated undercount is 7.7 percent. We don't know what it is among Spanish-origin people because there are no current vital statistics on the Spanish-origin population. It is not available on Spanish origin, mainly because it's very difficult to define "Spanish origin." We are setting up a Black and a Spanish-origin advisory committee, representative of local neighborhoods and various organizations with Spanish and Black interests. The leaders of these communities have come to understand the value of these census numbers. They know what they mean in dollars, and they know what they mean in political representation. We want to, in a sense, develop a communications system, so that the committee can go and talk to their people and convince them that they all ought to be counted. If that happens we'll have a better count.

You're right, there is an undercount, although it's not completely a methodological problem. It is certain people's unwillingness to be counted, for various reasons. We have the authority from the Congress to enforce a count, but our judgment is that if we ever attempted it, it would probably have a great negative impact on the society.

Individuals, Files, and IRS

Student: Do you have access to individual files? If somebody asked what a man had stated as his income on his census form, could you go to the files and check?

Mr. Barabba: I have access to the individual returns, but my legal authority allows me that access only insofar as I am carrying out

the Bureau's mission. Even so, access to the returns is severely circumscribed by the very nature of our organization. Some of the same problems exist here as would if anyone were to attempt to change the unemployment figure.

For the 1970 census we have microfilmed copies located at Jeffersonville, Ind., and Pittsburg, Kans. Normally, we would have one chance in five of having detailed personal information. Also, I must know where the person lived in 1970 in order to search our records, because the questionnaires are not kept in alphabetical order, but are indexed by county, city, and street. We could call Jeffersonville and locate the microfilmed questionnaire by checking the address register. The central safeguard of this operation is that only Census Bureau employees handle the material, and the penalty is a $1,000 fine or 2 years in jail, or both, for unlawful disclosure. While even more important is the effect such a disclosure would have on the Director's and the Bureau's reputation. Also, I am the only political appointee out of some 6,000 employees, so there is very little likelihood of my commiting such an act without anyone knowing about it. So, would you really want to come to me for that sort of information?

Student: You wouldn't be a good source but, does the Bureau ask for the Social Security number in the census?

Mr. Barabba: No, not on the census, which is mandatory. We do, however, ask it in the Current Population Survey, which is voluntary.

Let me ask you the question, why should we have it? Besides the negative aspects of the invasion of privacy, what are the positive aspects of the Bureau having access to the Social Security numbers of our population?

Student: You would know where they were issued and could see any geographic movement among those numbers.

Mr. Barabba: That would be one possibility. You'd have some idea of when it was issued, too, wouldn't you?

We talked about bias earlier and said we could measure sampling error, but it's very difficult to assess respondent bias. One question we are frequently asked is whether people tell the Census Bureau something different than they tell the Internal Revenue. It's important to note the Census Bureau doesn't want an answer about each individual, nor do we need it.

We could evaluate the accuracy of what people are telling us about their incomes by matching our records with those of the IRS. It may be that we would discover that the difference between Census and IRS income statistics is the result of different definitions.

Student: Isn't the real issue whether the Census Bureau should, in fact, be used as an agency of "law enforcement" to turn over certain information to the IRS for prosecution? Not necessarily individual information, but even if you're saying that you only do it in terms of groups. Is the matching of Census and IRS records an appropriate means to solve problems of comparative definitions? Aren't there other agencies who should more appropriately be involved?

Mr. Barabba: There are. But who should have the final say on what procedure we ought to use?

Student: It's not a question of procedure, it's a question of powers. Should the Census Bureau be given the powers to assist regulatory agencies?

Mr. Barabba: Who should determine whether the Census Bureau should be given those powers?

Student: The people through their elected officials.

Mr. Barabba: If we determine there's a better way of collecting data, then you are saying, as a citizen, you ought to be able to modify our procedures by operating through the Congress. That's exactly how the system operates. The Census Bureau is mandated under authority of Title 13 of the U.S. Code. Our powers are quite explicitly stated as to what we can and cannot do and our authority to determine what is mandatory and what's voluntary. Any time a Congressman feels that we have gone beyond our authority he has the right to have us explain what we are doing.

For example, because so many Federal programs are based on median income levels for an area, it might be advantageous to determine the degree of difference between Bureau and IRS income statistics. The Bureau would be willing to share its information, stripped of all individual identification. This cooperation should not be misunderstood as assisting the IRS in law enforcement, because we are protecting the confidentiality of our respondents. In fact, the information given to the IRS would consist of the socioeconomic characteristics of groups of people.

The study might indicate the tax system is not equitably collecting money from all segments of society. Or, it may reveal a social or educational problem that causes people to incorrectly fill out the Bureau or IRS forms.

It is my choice to do it—and take the heat from some Congressmen if it's a bad decision—or not—and take the heat from other Congressmen who say they need the information. That authority is well within the Bureau's rules and background experience.

Ironically, we are a great taker of records from other agencies. The economic census represents some 5.5 million firms in the United States. But only 2 million of these were actually interviewed. The other 3.5 million were small businesses, and we got all the data on them from the Social Security Administration and the IRS.

As long as we ascribe the same level of confidentiality that is ascribed to the information by the IRS it seems to me that we save money in the collection of information, and we save the respondent the burden of filling out the form again.

But what do we give back? As I said, nothing in the way of individual information, only socioeconomic characteristics of groups of people. Also, we report that census data tends to be overstated or understated from IRS data by such a factor. We're going to have a legitimate piece of information that planners ought to have.

We actually did something like this last year. The 1973 Match Study was a joint statistical project among the Social Security Administration, the IRS, and the Bureau. It involved matching persons in the March 1973 CPS with their survey data, social security earnings and benefits, and a small amount of Federal income tax data.

The purposes of the project were to use the administrative data to determine the correctness of the survey data and to ascertain any biases in the Bureau's statistics. The study was designed also to use the administrative data to correct misreporting of the survey information and to augment the survey with

data the respondents were not asked to provide. This type of data combination can be used as inputs to models which simulate the effects of a new tax transfer program or changes in existing programs, to develop corrected gross and net income distributions, and to test and evaluate various statistical matching procedures.

Special operating procedures were instituted at both Social Security and Census to insure the confidentiality of the shared information. The laws and regulations which govern the agencies are explicit in the restrictions on such shared information. The Census Bureau hired, as temporary employees, a small group of Social Security personnel. Both they and the regular Bureau employees were sworn to uphold the confidentiality of the information under penalty of law. Also, a special Social Security commissioner's decision had to be obtained for the project. And like the IRS, the Social Security Administration placed certain conditions on the use and processing of its information.

Student: Just out of curiosity, how quickly do you think the hammer would fall if Federal agencies tried to affiliate or link data on individuals?

Mr. Barabba: Before the agreement could be made, because somebody in the Bureau who didn't like it would call a friend of his who would call a Congressman. It would be instantaneous.

We have a very open system in the Government, and particularly in the statistical area. All this dialogue would take place in open meetings. We would sit down with every one of our advisory committees and go through a very similar dialogue to what we're having right here. The American Marketing Association might say, "That would be the most important thing you ever did." But the American Statistical Association might say, "It's not statistically meaningful." They might argue about the methodology we're using. And the confidentiality advisory committee might tell us that we were out of our minds.

SOCIAL OBSERVATORIES . . . . THROUGH A GLASS, LESS DARKLY

Vincent P. Barabba, Director, U.S. Bureau of the Census

"By future shock I mean the disorientation and decision overload produced by high-speed change . . . . The accelerated arrival of the future is forcing millions of us . . . to live at a faster tempo than our nervous systems can tolerate. It subjects us to dangerous overstimulation. It predisposes us to disease. It creates psychological stress. And it sometimes leads to a breakdown of our capacity for rational decisionmaking."

Alvin Toffler, author of **Future Shock**, from interview in J. Walter Thompson house organ, "JWT World."

Millions of men and women today are in this situation. The decisions they face are coming at them faster and faster—decisions which affect more people, money, land, and resources than ever before.

The accelerated pace of decisionmaking has made it uncomfortably clear just how interdependent we are as individuals and organizations in society. One decision by A affects B's thinking, and since B has practically no time to consider alternatives, he acts, affecting C . . . .

One of the effects of the increased tempo of decisionmaking is the truncated time available to check the accuracy of information. Often the demand for action is so great that data are hastily assembled and used and are simply assumed to be adequate. And, unfortunately, data are often outdated or incorrect, or both. In today's world, decisions—whether at the domestic household, corporate headquarters, or Federal Government level—need to be made quickly, confidently, and based on accurate data.

It has been said that we live in an age of rising expectations. It can be added that when the tempo of achieving these expectations slows, or the path toward them becomes ill-defined, society becomes restless. We expect sound decisions from leaders in the public and private sectors to sustain the momentum of progress. And our highly effective mass communications system ensures that the results of decisions become widely and quickly known.

Mass communications have achieved something else. They have conditioned the individual to encounter statistical information as part of his everyday experience.

Statistics often appear in commercials ("Three out of four doctors. . ."). Television programs live or die according to the Nielsen ratings. We are accustomed to the Lou Harris, Elmo Roper, and George Gallup organizations sampling public opinion on the issues of the day. The rise and fall of both the Dow-Jones Industrials each day and the unemployment figures each month give us indications of the health of the economy. An earthquake in Latin American registers 6.8 on the Richter Scale, and we know it was a sizeable geological event. And if the local weather report says the probability of precipitation is 30 percent today and 90 percent this evening, we gauge our activity for the day accordingly.

But the familiar epigram "A little knowledge is a dangerous thing" was never more true than when applied to statistics. The public's casual familiarity with statistics, plus its rising expectations of well-being, have joined to create a situation in which the man on the street wonders why his leaders can't improve the quality of life and better identify and solve today's problems.

An often heard complaint is "We can put a man on the moon, but we can't set up decent urban transportation. . . straighten out the welfare situation . . . build enough sewage treatment plants. . . ," etc.

At the same time, measurement of social conditions is inhibited by the public's overestimation of the abilities and applications of computers, leading to vague fears of an ominous national data bank which would store every fact of their personal lives for instant retrieval by any Government agency requesting information. For this fear to be realized, the United States would have to abrogate not only current laws but its entire democratic tradition.

A refined version of this fear is that increased knowledge about society in general will lead to the ability to manipulate the public mind—a fear that discounts both society's increasing sophistication and its increasing resistance to persuasion.

Need for Social Reporting

The realization that a method of social reporting is needed has been growing for some time. In the mid 1960's a welter of proposals began to appear. The National Commission on Technology, Automation, and Economic Progress; a special panel of 41 top social scientists established by the Secretary of Health, Education, and Welfare; the Presidential Commission on Federal Statistics; bills offered by legislators; and many private individuals and organizations—all proposed approaches to, or the rationale for, a system of social reporting.

One of the more interesting proposals came from Prof. Harold Lasswell of Yale, who called for the establishment of a system of social observatories to provide data and analysis for sound decisionmaking. He reasoned that the computer revolution had made it possible to more fully realize the potential of two important underutilized areas—the growing number of skilled data gatherers around the country and the enormous data base already collected and tabulated, but to a large extent lying fallow.

Lasswell advocated continuous decision seminars which, using computers, would examine the possible effects of proposed goals and strategies on various segments of society. Such studies would operate in a context including the immediate, intermediate, and remote future as well as the recent and remote past.

But, Lasswell did not look on such seminars as a panacea. He said it was not necessary for them to present an exhaustive picture, but if the facts involved could be known with a greater degree of precision and certainty, the seminars would accomplish their purpose.

Lasswell's desire, basically, was to put social observation on a scientific footing. Certainly, the work of social scientists committed to a systematic approach to measurement should be accepted with the same degree of credibility as that of physical scientists and not automatically relegated to a lesser standing.

A good example of this kind of thinking appeared in a **New York Times** editorial early in 1974, which decried the lack of analysis of the nature and extent of suburban expansion and its results. In part it read: "Except for some sociological studies, there is little except empirical observation of the chief American environmental phenomenon of the century." Why is the vast amount of work done by social scientists on the subject of suburban growth tossed aside so readily? Is it because social scientists have not agreed upon a standardized scientific approach?

Indeed, social scientists do not agree. Many would like to operate as their colleagues do in the physical sciences. But there is also a body of opinion among social scientists that their job is to raise questions, not to answer them.

The social science-physical science comparison is tempting. It conjures up a picture of social scientists manning an observatory, analyzing data, and solving problems just like astronomers at Mount Palomar or Kitt's Peak observatory.

But that is a misleading picture. It is one thing to accurately measure the distance from Mercury to the Sun and quite another to determine that a complex mix of social factors is at the point in a given neighborhood that more cases of venereal disease may be expected in the future.

Perhaps a much closer analogy would be that of astronomers examining various theories of how our solar system originated. While none of the theories will ever be proven beyond a doubt to be correct, their formulation and the discussion they spark help to solve many other unknowns and to define areas of future observation.

In this case, the social scientist has an advantage over his counterpart in astronomy. Like the astronomer, he can examine the present and the past and formulate a theory. But, unlike the astronomer, he can see it put to practical use by making data available to decisionmakers to help avoid, modify, or duplicate a given situation. And then, by monitoring and evaluating data to measure change, he can give an indication to the decisionmakers of the success or failure of their course of action. It is this ability which gives purpose to the whole concept of the social observatory.

What Is a Social Observatory?

At this point, we enter the semantic fog surrounding social reporting. What is a social observatory? One definition is that it is an organization which provides detailed demographic and social intelligence, not of individuals but of statistical aggregates. These aggregates in turn allow for the efficient conduct of national social and economic programs and the coordinated planning of effective domestic policy.

Another definition—consistent with the first—is that a social observatory is an instrument which provides the means for developing measures of the seeming elusive quality of life. These measures are generally referred to as social indicators.

What is a social indicator? The definition of the term is difficult and is only beginning to take form. The Center for Coordination of Research on Social Indicators has established this working definition of social indicators: "We take them to be statistical time series that measure changes in significant aspects of a society."

Another way to place social indicators in context would be to look on them as fulfilling the same role as a blueprint. A blueprint does not build a structure but provides the best available information to those at the construction site whose job is to put up the building. No blueprint can replace the human evaluation and judgment at the site, factors which make the building possible. In the same way, social indicators will provide the best available information to decisionmakers.

What social conditions should be measured and how to measure them is also a difficult question. One school would have social reporting take the form of a system of social accounts, much as our system of economic accounts reports on the health of the Nation's economy. The rationale is that just as there is a GNP—Gross National Product—there could be a measure of GNWB, or Gross National Well-Being. Like the analogy of the physical science observatory, this is tempting because it sounds as if it would result in a measure which is easy to grasp.

But this is too convenient a comparison. Our economic accounts report on a structured, quantifiable entity—the U.S. economy. Granted, that economy is an awesomely complex thing, but the myriad elements of each part of the economy—retail, wholesale, service, manufacturing, mining, transportation, and construction—combine in standard building blocks to make up the total American marketplace.

The advantage frequently cited in relation to the GNP is that all the elements can be reduced to a common denominator—the dollar. This also is cited as a drawback in that the GNP treats a dollar's worth of bubble gum the same as a dollar's worth of penicillin. There is no effort to measure social utility. Critics say there is inadequate recognition of the negative aspects which are created along with the positive—for example, the price paid in pollution for the manufacture of a given item.

It also should be pointed out that the system of national accounts took years of effort by many brilliant economists to construct and refine into reliable, consistent measures. Yet, that system is not without its critics and advocates of change, in spite of its wide recognition as the premier indicator of the Nation's economic health.

While much of the data in the social field is also quantifiable, no successful system has yet been proposed to combine these factors into meaningful totals. How do you measure the well-being of some 210 million individuals with differing aspirations and talents? How do you develop an index which will reflect happiness, respect, or dignity?

Work is underway to develop a series of social indicators aimed at measuring these facets of the quality of life. These efforts assume that no single GNP type of accounting—even if it were developed—would be widely useful.

Defining Social Concerns

The Office of Management and Budget in the Executive Office of the President recently published **Social Indicators, 1973**, which identifies eight major areas of social concern—health,

public safety, education, employment, income, housing, leisure and recreation, and population. While this publication is valuable because it gathers a large amount of useful data into one place for the first time, much of it from the Census Bureau, it does not present true indicators of how the population relates to each of the areas of social concern. The introduction makes that clear:

> At the present time, not enough is known about the cause and effect of social conditions to develop such ideal indicators. Rather, the indicators presented in this publication represent simply a first step toward the development of a more extensive social indicator system.

Developmental work on social indicators is not confined to the United States. A special committee of the Organization for Economic Cooperation and Development (OECD) recently completed 3 years of effort to codify a list of social concerns. The basic criteria were that the concerns must be common to most of the 23 member nations and that quantifiable measures could reasonably be expected to be developed.

The OECD list also identifies eight major areas—health, individual development through learning, employment and quality of working life, time and leisure, command over goods and services, physical environment, personal safety and the administration of justice, and social opportunity and participation. But these eight areas are not the ones for which social indicators are expected to be developed. They are simply general headings for the 24 fundamental social concerns which make up the list, 14 of which have subconcerns.

For example, under the broad area of Employment and Quality of Working Life are 3 of the 24 fundamental social concerns: (1) The availability of gainful employment for those who desire it; (2) the quality of working life; and (3) individual satisfaction with the experiences of working life. This third item is divided into several subconcerns that include working conditions; career prospects; and supervision, autonomy, and job challenge.

This list of 24 social concerns provides the framework for the next phase in the OECD program which is to develop a system of social indicators or, as the introduction to the list puts it, an agenda for "proceeding from the general toward the specific."

By the fall of 1972 it was evident that serious work was proceeding on so many fronts that it was difficult for those interested to keep track of the major developments in the field. This situation prompted the Social Science Research Council, under a grant from the National Science Foundation, to establish the Center for Coordination of Research on Social Indicators based in Washington. The Center is serving as a clearinghouse for significant new research in the drive to establish a system of social indicators.

It is important to define the relationship between social observatories and social indicators. If social indicators are the information tools for decisionmakers, social observatories provide the materials from which to make the tools, much as iron ore is converted to high grade steels from which tools are then made. In this case, the iron ore is raw data, and the high grade steels are the gathering, tabulation, and first- level analysis of data.

In other words, without social observatories there can be no social indicators.

Some social scientists point to the gaps in our society's knowledge about itself and say there is an even bigger job to be done than most of us realize. But the United States is better off in the field of social statistics than the rest of the world. Its recordkeeping was specified in the instrument which established the organization of the Nation, the Constitution.

Individual Measurements

In a way, it is easy to overlook the value of the decennial census simply because we take for granted its unbroken record of 190 years of data gathering. To us it is not unique. But the French statistician Moreau de Jonnes noted in the last century that the United States presented a phenomenon without parallel in history:

> . . . a people who instituted the statistics of their country on the very day when they founded their government, and who regulated by the same instrument the census of inhabitants, their civil and political rights, and the destinies of the Nation.

Much newer, but an invaluable complement to the decennial census, is the Current Population Survey (CPS). Taken every month since 1940, through wars, recessions, booms, and periods of great social change, this survey provides fast, up-to-date measures of many social trends—family relationship, education, mobility, and income, to name a few. Its value to users has been great because the CPS data, month in and month out, have been consistent, using as it does a comparable statistical universe and quality standards.

Together, these two—the decennial census of population and housing and the Current Population Survey—form the undergirding for social measurement in the United States.

Of value too is the other, less well-known work of the Census Bureau, including a number of censuses taken at 5-year intervals: the census of agriculture, the census of governments, and the economic censuses, which cover manufacturing, retail and wholesale business, service industries, construction, mineral industries, and transportation. The government and economic areas are supplemented by a comprehensive series of surveys, some taken at weekly intervals, to fill in the 5-year gap between censuses, much as the CPS does for population characteristics.

The Census Bureau could serve as a social observatory in the broadest sense, having been a supplier of unbiased data for almost 200 years. Since 1790 it has been the cutting edge in the development of social measurement, a role it is continuing to perform.

The decennial census has grown from little more than a head count to an enormous reservoir of general statistical information, an evolution that occurred to keep up with the increasing demand for data.

Manual tabulation was adequate for the first century of census taking, but despite the size of the population and the length of the 1880 questionnaire, hand tabulation was still going on when time came to take the 1890 census. A former census employee, Herman Hollerith, invented electrical-mechanical tabulation of information through holes punched in paper cards, a system 100 times faster than manual methods. By doing so, Hollerith added a new dimension to census data: timeliness.

One of the Bureau's most valuable assets is the contract of trust it has built up through the years with the American people regarding the confidentiality of answers recorded on census questionnaires. What had been tradition and internal regulation

became public law at the turn of the century, guaranteeing this confidentiality. This extends even to denying requests for data about individuals from other Government agencies. Significantly, it has never been necessary to prosecute a Bureau employee for revealing confidential information.

The gap between decennial censuses has long been recognized as a problem. In 1940, the Bureau pioneered sampling theory, in which the answers of a scientifically selected sample of the population can be extrapolated to come very close to the answers that a full census would provide, and at a fraction of the time and cost. This technique has allowed a monthly survey of population trends to supplement the data base of the decennial census.

By 1950, another data-handling problem was shaping up. The size of the U.S. population was such that even punchcard processing meant too long a time span between taking and publishing the census. The Bureau supported research and development of the first electronic computer put into use for mass data handling, UNIVAC 1.

More recent developments have allowed census tabulation to bypass the punchcard stage, putting information from questionnaires directly into computers through the medium of machine-readable microfilm. This method allows easier access and less expensive storage since the bulky original paper forms can be destroyed once the census is tabulated.

The 1970 census was largely a mailback effort, meaning that most households filled out their own form and mailed it back without seeing the traditional enumerator. This represented large savings in time and manpower. For the mailback method to work, however, a massive effort by Bureau geographers was needed to produce standardized maps of all urban areas in the Nation. This was done so that each address could be correctly allocated to the proper geographic location. This work led directly to the latest breakthrough in data handling.

Potential Use

For some time it has been realized that in one major field the great potential use of census data was largely untapped, just as Prof. Lasswell noted—the local level. Most problems exist and are acted upon at the local level. Decisionmakers at this level did the best they could with what they had, but their uses of census data were severely limited. This was either through lack of knowledge about what census data could do to help or because of lack of time and staff to utilize census data in traditional forms. Added to these factors was the problem that locally gathered data were not compatible with census data. The tools existed, but access to them was practically nonexistent.

In the fall of 1966, the Bureau started its first small-area research and development project, the New Haven Census Use Study. Basically, this was an attempt to get the more than 60 agencies in the New Haven metropolitan area to cooperate in identifying their common statistical needs, pooling their data, and developing a computer system to aid in problem solving.

The results of this project and others have been exciting and have had significant impact. Tools have been developed which are allowing data gathered locally to be linked with census data. This combination has endless applications including more effective government, environmental efforts, transportation, law enforcement, education, health care, location of new facilities, and market analysis. Continuing followup projects in Los Angeles, Indianapolis, and San Francisco are refining these tools.

The tools developed include GBF/DIME—the Geographic Base File, with Dual Independent Map Encoding, and ADMATCH. GBF/DIME system creates a detailed computerized source map which serves as a base for quickly and accurately locating addresses, calculating area, measuring distance, etc. ADMATCH is a group of computer programs to match addresses to respective area units—street segments, blocks, tracts, etc. This permits two or more data sources to be aggregated by the same geographic unit. In this way, different data sources are linked, allowing examination of the relationship between two or more variables simultaneously. In other words, it is now possible to compare data for school districts with those for police precincts or with those for fire districts, even though all the local areas have different boundaries.

These sophisticated computer tools, while greatly aiding local problem solving, do not breach standards of confidentiality. Like more traditional data formats, they are statistical aggregates—information about groups of people, not individuals.

The full potential of locally gathered data may be realized in one statement of fact: there are nearly 80,000 local government jurisdictions—an overlapping complex of political boundaries, fire, sewer, school, soil conservation, water, air pollution, law enforcement, and other districts. Not counting school districts, there are more than 17,000 local jurisdictions in the Nation's metropolitan areas alone. One of the most unsettling projections in the Report of the Commission on Population Growth and the American Future (Vol. 4), 1972, is a continued proliferation of local jurisdictions.

The impact on decisionmaking of the ability to blend local data and census data into common area units and to transform these data into information, using quickly made and inexpensive maps and charts, cannot be overestimated.

Punchcards, methods of maintaining confidentiality, sampling theory, the computer, the mailback census, the geographic base file—all have had a profound effect on data gathering and handling.

However, a social observatory's value is greatly diminished if all it does is gather data. It must disseminate information on a timely basis if it is to be a vital, current social instrument, rather than only of historic import. This has been realized at the Census Bureau, where increasing efforts on behalf of data users have been made during the past decade. This policy has been summed up in these words: "The providers of data give us the wherewithal, but it is the users who give us purpose."

This thrust is not simply aimed at creating more data but at transferring data into information which can be put to use by narrowing the range of uncertainty in the decisionmaking process. Some of the user-oriented steps taken at the Bureau include:

A. **Greatly expanding the publication program of the 1970 census.** More than twice the number of pages of data were issued in 1970 compared to 1960, and those pages each contained about 20-percent more material.

B. **Publishing data in new formats.** In addition to the traditional printed publications, statistical tables were issued on microfilm and michofiche.

C. **Making computer tapes available to the public.** For the first time, tapes covering units from city blocks to the State level were sold at cost. These usually were available before the printed reports were published. The

availability of these tapes sparked the establishment of more than 175 Summary Tape Processing Centers around the Nation. These centers have been set up by public and private organizations so that data users with common interests can share the cost of operations on a cooperative basis. Special tabulations have been put within the reach of all who need them, quickly and inexpensively. Once again, confidentiality has been maintained, with individually identifiable data being suppressed as the tapes are prepared.

D. **Establishing permanent user-oriented facilities within the Census Bureau.** This effort has two main parts—the Census Use Study, which develops innovative uses of census data, and the Data User Services Division. The division's charge is to improve the usefulness and delivery of census data to meet the changing needs of the data user community, with special emphasis on service to local areas.

E. **Setting up an intensive conference, seminar, and workshop program.** This program is aimed at generating new data users and helping those who are already familiar with census data. Thousands of persons in every State have participated to learn the spectrum of census data products and their application.

The development of this user-oriented outlook stems from the recommendation of the Bureau's eight advisory committees. These committees form the key feedback vehicle from the user community. Staffed by top men and women in their fields, the committees represent a broad spectrum of public and private data users. These Census Advisory Committees are:

—Committee on Agricultural Statistics
—Committee of the American Economic Association
—Committee of the American Marketing Association
—Committee of the American Statistical Association
—Committee on Population Statistics
—Committee on Privacy and Confidentiality
—Committee on Small Areas
—Committee on State and Local Government Statistics

These committees assist the Bureau to meet the challenge of not only doing things right but ensuring the right things are done.[1]

In its role as a social observatory, the Census Bureau will continue to reconcile what is available with what is needed. It will continue to provide the data base for social reporting by expanding and refining its data products. This is a familiar role for the Bureau—it does not make policy but provides the right statistics for policymakers to help them act intelligently.

Future development appears to lie toward a dual concept of social reporting—national and regional on the one hand, and local on the other, based on compatible methodologies. Schematically, the data flow is represented in the chart.

The interchange between the national and local data flows would be made possible by use of a common set of basic geographic elements, tailored to the needs of the areas concerned, yet made of compatible building blocks.

Once again, it is obvious that without social observatories, there would be no social indicators.

The Census Bureau is ready to aid all levels of decision-making and is unique in that its products come in building-block sequence—street, block, enumeration district, tract, town, city, county, State, regional, and national.

Social reporting is an idea whose time has come. Its shape is unknown at this juncture, and it will be some time before a meaningful system of social reporting is in general use. But the first developmental steps have been taken.

Problems

At this stage, there are three main problems. One is definition. What do we want to measure? Given the incredibly complex interaction of the elements of society, there is an infinite variety of activities, accomplishments, and needs to be measured. It must be realized that what we don't know will always be greater than what we would like to know.

This leads to the second problem, setting priorities. Given an infinite number of items to measure and finite resources with which to measure them, the hard business of choice must be faced squarely and a beginning made. Initial choices will almost certainly not be comprehensive. Indeed, the list will constantly need revision. Since the cornerstone of social reporting is measurement over time, changes must be made only when clear need is established and agreed upon.

The third problem is utilization, something to which the Census Bureau can contribute, while definition and priorities are developed. It is doing so by making its data products more widely known, more usable, more accessible, and available in a reduced amount of time.

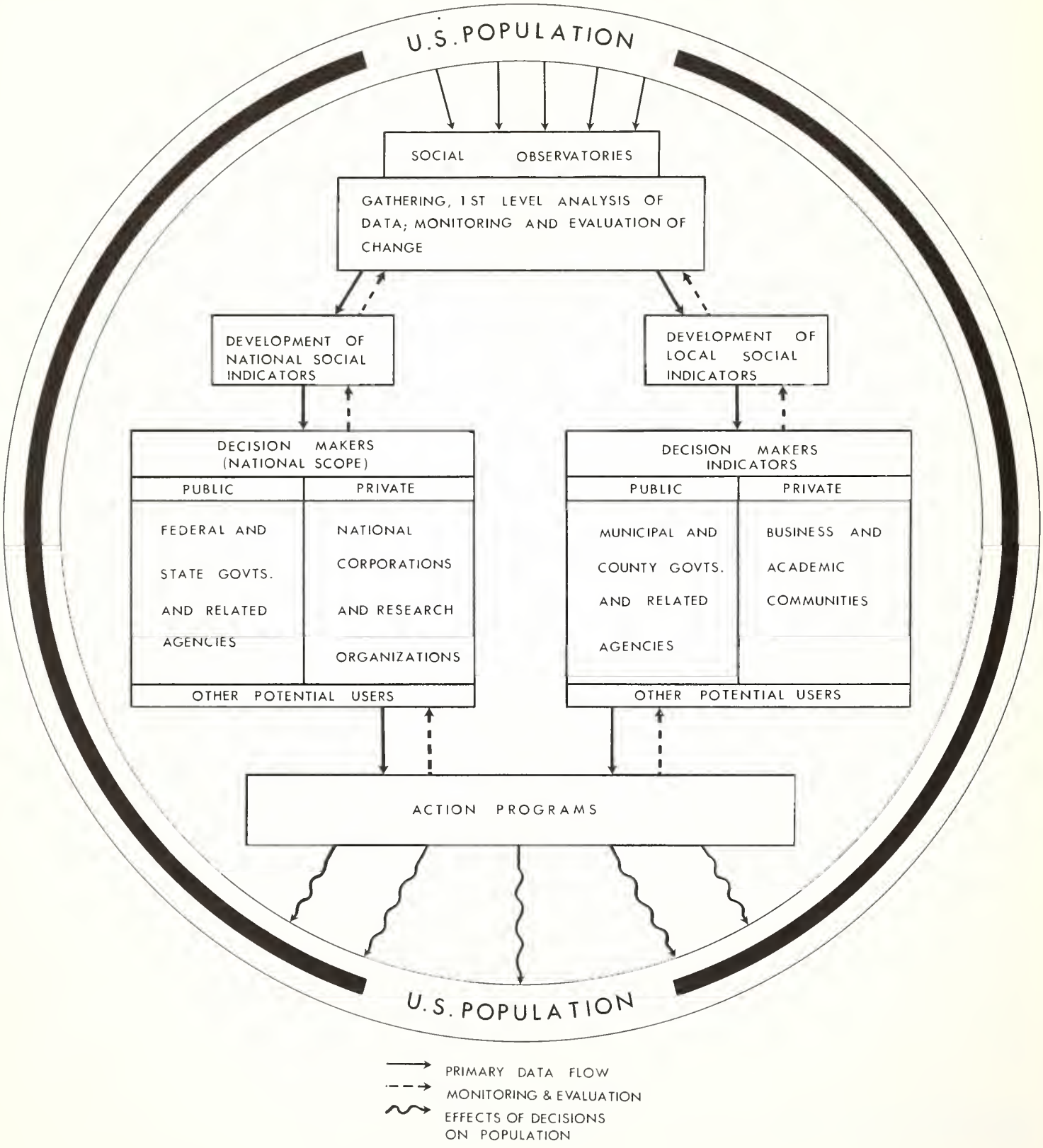
There are many interested groups working toward a system of social reporting. The Census Bureau is ready to participate with all of them by making its past, current, and future information available, as well as its capability and understanding of data collection, developed as it accomplishes its mission as fact finder for the Nation.

This is an exciting time to work in the social observatory field. The stakes are high. As Alvin Toffler said in his interview with "JWT World."

> Super-change, and the decision crisis it is provoking in our culture, will compel us to think about change in totally new ways. Those who cannot will fall by the wayside—casualties of the accelerative thrust, victims of future shock.

The role of the social observatory is nothing less than to minimize the number of those victims.

[1] Since this statement the Bureau has established two additional committees: Census Advisory Committee for the Black Population for the 1980 Census and Census Advisory Committee for the Spanish-Origin Population for the 1980 Census.


U.S. POPULATION
SOCIAL OBSERVATORIES
GATHERING, 1 ST LEVEL ANALYSIS OF DATA; MONITORING AND EVALUATION OF CHANGE
DEVELOPMENT OF NATIONAL SOCIAL INDICATORS
DEVELOPMENT OF LOCAL SOCIAL INDICATORS
DECISION MAKERS (NATIONAL SCOPE)
PUBLIC
PRIVATE
FEDERAL AND STATE GOVTS. AND RELATED AGENCIES
NATIONAL CORPORATIONS AND RESEARCH ORGANIZATIONS
OTHER POTENTIAL USERS
DECISION MAKERS INDICATORS
PUBLIC
PRIVATE
MUNICIPAL AND COUNTY GOVTS. AND RELATED AGENCIES
BUSINESS AND ACADEMIC COMMUNITIES
OTHER POTENTIAL USERS
ACTION PROGRAMS
U.S. POPULATION
PRIMARY DATA FLOW
MONITORING & EVALUATION
EFFECTS OF DECISIONS ON POPULATION

A DISCUSSION OF PRIVACY

Vincent P. Barabba, Director, U.S. Bureau of the Census

"The point I hope I made in my paper was that information maintained to describe or characterize specific individuals requires a whole different set of rules and regulations than aggregate information released only in total and not related to any specific individual."

Vincent Barabba

Mr. Barabba: The debate over the individual's right to privacy can really get out of hand. Recently, I testified before Congressman William S. Moorhead's Subcommittee on Foreign Operations and Government Information concerning the Goldwater-Koch Bill and others which deal with the responsibilities of those who collect or maintain individually identifiable information.

The Goldwater-Koch Bill is quite good as long as people realize that there are significant differences between agencies that collect data from individuals for statistical purposes and those which maintain dossiers for administrative purposes.

The Goldwater-Koch proposal is designed to regulate the collection and use of data by Federal agencies. It incorporates most of the central guidelines proposed in the 1973 HEW volume **Records Computers and the Rights of Citizens.** The book was a landmark example of a Government agency's recommendations for regulation, rather than those of a private agency.

Let me give you an example of some of the quasi-political-philosophical confusion that arises over the privacy issue. Moorhead's Subcommittee was talking about a provision of the bill which states that the Social Security number may only be used by the Social Security Administration. Congressman Paul McCloskey, a member of the Committee, indicated that some district attorneys reported the use of the Social Security number was very helpful in tracking down individuals who had fled a particular area. Congressmen McCloskey asked a Congressman who was testifying if the bill under consideration wouldn't inhibit the ability of law enforcement agencies to locate people. The witness responded that in the case of persons who were delinquent on child support payments, and faults of that nature, the authorities ought to be able to use the Social Security number to get them; but he added if a person was delinquent with a car payment, pursuit via the debtor's Social Security number would be hard to justify, and the Social Security number should not be used.

At that point I leaned over to my legal counsel and asked if I had missed something! You can see why privacy is a very emotional topic. It was all right to use the Social Security number for things that the Congressman favored philosophically, but it was quite different with regard to those he opposed. If at all possible, we have to keep the privacy issue from becoming a political football. The rules we lay down must be well thought out and considered, with distinctions clearly drawn.

Getting a rational conversation going is a very difficult task in political Washington. It's a lot easier to sound as though one is protecting his constituents by saying "No" to everything related to their right of privacy. It takes a person with convictions to argue for the Government's need to know. Because of this dilemma the Bureau is going to spend more time, as an institution, trying to tell the other side of the story. If we don't, we fear we may have to tell the Federal agencies and Congress we can't get information for them anymore because we can't afford, or we're not allowed, to collect it under the privacy restrictions. At the very same time we testify before one committee concerned about privacy and the possibility of collecting too much data, we may have to go to another committee and explain why we aren't able to give them all the information they feel they need.

Take the education bill passed recently. There's a provision that within a year of its enactment the Secretary of Commerce in conjunction with the Secretary of Health, Education, and Welfare shall expand the Current Population Survey to provide estimates of the population by age range within poverty households. That's a very, very difficult task in the first place. But, if the rule was laid down that we couldn't call on people in their homes, it would become impossible.

We have to continue reminding each committee of the Congress what the other committees have told us we can't do. It's not that the Congressmen are inconsistent. But, the committee structure is such that sometimes one committee will operate without others being aware of its activities. All the privacy legislation being debated has little to do with census legislation, which goes through an entirely different set of committees, although privacy rulings will directly affect the Census Bureau. Because of this system the Bureau has to keep its eyes and ears open to all types of legislation being considered. Recently, in reaction to the Watergate situation, Senator Lowell P. Weicker, Jr., attached an amendment to the White House Authorization Bill. The amendment says that if anybody in the White House or a Federal agency wants to examine individual records from the Internal Revenue Service, he must have an authorization personally signed by the President of the United States. While Senator Weicker saw this amendment as necessary to protect the Internal Revenue Service from future onslaughts by White House personnel—and I agree in principle—because of the wording, it unfortunately would also hamper the entire administrative records program at the U.S. Census Bureau.

In response to amendments such as Senator Weicker's, the Bureau must go to the appropriate conference committee and explain its side of the story. In the case of the Weicker amendment the Bureau would face a major problem, as passage would deprive the Bureau of the means to produce intercensal population estimates. The conference committee has to decide whether to approve the amendment or kill it in committee.

The privacy debate has come about, I think, because right now in the United States we are seeing revealed the abuses—potential and real—of personal records. Unfortunately, people are tending to confuse the meaning of expressions like "the right of privacy." All of you filled out a registration form for this class. You could have claimed that was an invasion of your privacy. You were willing to provide information on that form, including

your Social Security number, in order to be able to get the credits for this course. Everyday, it seems to me, aspects of this "right of privacy" are compromised.

Student: Why is it even necessary to record an individual's name on a census schedule?

Mr. Barabba: There are two reasons. One is the service that we perform for people who need to verify where they were at a certain point in time. Only that person or a direct bloodline relative can gain access to that information.

Until recently—and in some parts of the country even today—administrative records such as birth certificates and property tax rolls were not carefully maintained and census data was the only accurate record available. Prior to 1900 Bureau records were all publicly available. There has been a tremendous demand for these 1900 to 1930 reports because people moving into the Social Security benefits age range didn't have birth certificates to prove their age. An individual's documented census record will still today suffice as one of the proofs of age and nationality for Social Security and passports.

The other reason is that when we do some of this matching activity discussed earlier, we want to call back on individuals. In other words, if a program needs additional information on disabled persons, we have to be able to go into our files and find the addresses of people who are identified as being disabled. These persons may have moved, so we need to know the names in order to discover their location. We would attempt to use these people as part of our sample, though it would be voluntary whether they responded.

The important thing is that for the 1970 census we separated the name of the individual from his or her responses. The name never goes into the computer. Individual names can be found only on a microfilm copy of the original questionnaire, and the copy is kept in a secure file for the specific purposes I mentioned. I am aware of no other records.

Student: I have the feeling that privacy is an emotive issue. Perhaps for comparative and persuasive purposes you should offset it with another emotive term such as "secrecy."

Mr. Barabba: That's interesting, because the Swedes have what they call the "publicity principle." In Sweden, until very recently, nothing was secret; absolutely nothing. Any public record was open to the general public for review. Tax records, everything, were there for anyone who wanted to see them.

The argument in favor of this system is that one need not worry about the Government ever doing something behind closed doors. This principle evolved over several centuries, and goes back to the 1600's when Sweden's church kept a list of all the people. Then, for a while, the Government retained the church to keep the list and now the Government does this itself. As Sweden is a socialized society, the individual's benefits are derived from a system where the Government needs to communicate directly with its constituents and needs considerable detailed information for planning. So, when you move, you work very hard to keep the Government apprised of where you are because your whole benefit package is tied to whether you're on the list. But that list and everything on it is generally publicly available. There have been attempts to restrict some of the information. It's a lot easier to maintain such a policy in a society which has grown up with that tradition than it would be in the United States with its traditions of individuality.

Let me change the topic and ask for your reactions to the general theme of my "Right to Privacy" presentation.

Student: I felt that you had some kind of an ax to grind while at the same time you were trying to present objective information. I felt you were justifying the existence of the Census Bureau and what it does and what it needs to do, which may be misinterpreted as an invasion of privacy.

Student: I like the word "justify" because the allocation of resources and continued socioeconomic growth and development demand you know what trends are occurring to ensure effective, efficient decisionmaking.

Student: I have the feeling that you didn't just sit down and say, "I'm going to write what the Census Bureau does." It reads more like a reaction to forces that have been pressuring you.

Mr. Barabba: I think that's true. I probably spend 20 percent of my time grappling with the privacy issue, and to that extent it is a reaction. However, we're more than satisfied with our operating law, which is quite clear about what we can and can't do, and it's the toughest existing privacy legislation on the books today. It's so restrictive that other agencies of Government have a hard time living with us because we cannot let them look at the individual responses. We'll only give out statistical aggregates, unless we collect the information under another agency's authority and tell those being interviewed just that.

Student: Then, is the problem that some people, either the Congress or the general public, are uninformed as to how clearly delineated both in the statutes and in practice your treatment of the respondent's privacy actually is?

Mr. Barabba: That is correct. We have the problem of the Congress creating new legislation which, in a sense, is to be superimposed over the existing census confidentiality statute. In the cold of the energy crisis we argued against proposed legislation to allow the Federal Energy Office use of individually identifiable Bureau records of corporations and business enterprises. This caused us considerable concern, as our governing statute states quite clearly, and so we tell those we interview, that business records are only to be seen by Bureau employees. In fact, there was a Supreme Court case which led to the Congress enacting specific legislation to protect business reports. If other agencies were able to use the individually identifiable records in a way that could be harmful—or interpreted as harmful—to businesses, our statistical accuracy would go out the window overnight.

Student: As a probation officer I'm aware of the many calls our office gets from outsiders who are seeking information about individuals. I'm concerned that any information we give out may be harmful to the individual in question. I feel the same way about your census data. That is, can the information you collect eventually reach another agency in some sort of individually identifiable form?

Mr. Barabba: The point I hope I made in my paper was that information maintained to describe or characterize specific

individuals requires a whole different set of rules and regulations than aggregate information released only in total and not related to any specific individual. I think the rules now being developed as restrictions on personal data banks must be tight. I also think people at the local level must maintain the same attitude about their data as we at the Federal level.

We are concerned, as well, with the responsibility of local officials as regards the privacy of individuals. An ideal privacy law would reach down to the local level in its protection of individuals, because the closer you are to people the more chance there is that you can hurt them directly and individually. If you want to know about an individual in a town of 10,000 people, you are not going to run back to Washington and go through his census questionnaire. You're going to want to go to the local police department or the neighborhood credit bureau. You'll just go to these local files and pick out the information you want.

Student: I tend to think that most people are honest and don't have much to fear as far as information collected by the Census Bureau goes. On the other hand, I think people are and should be concerned about the individually identifiable information collected and exchanged by corporations, banks, and credit agencies.

Mr. Barabba: That is another interesting problem. One of the pieces of legislation being proposed says that, if a Federal unit holds information about an individual, that person must be informed. If you plan to release information about an individual for other purposes than those for which it was requested he would be told that as well. Some would even say that you have to tell a person every time you change his record. Additionally, the company, bank, or whatever, would have to maintain a system that allows retrieval of all the information collected about any individual. And, if it can be shown in point of fact that it is incorrect, they would have to make the appropriate changes.

One thing that has to be kept in mind when we consider placing these sorts of requirements on companies, or anyone, is that it is going to cost more money to process individual records. This increased cost is because a system that is created and maintained to allow rapid access to these records is more expensive to design and operate. We have to ask ourselves whether it is worth those extra dollars to make certain that a person's confidential relationship with a bank, agency, or company hasn't been breached.

Student: In "Privacy and the Need to Know" you write about mailing lists and how you view them as a slight annoyance at best. Yet, I'm really skeptical about direct mail advertising, and I object to the intrusion on my privacy. My belief is that, if you go out and shop around for the same item, you can beat the mail price. I don't touch door-to-door salesmen or junk mail. Would you elaborate on your philosophy.

Mr. Barabba: Let's explore the question of whether or not the sale of your names to someone who advertises by direct mail is bad or good. My argument would be to determine whether your individual privacy, in this case the minimum of your name and address, is of greater value to society than the value to society of the actions performed by the release of the information; namely the distribution of goods.

Let's talk about it from a marketing point of view. What is marketing? Marketing is the efficient distribution of goods, economic goods, to a society. You have products and you have people. We must now find how to get them together.

We'll just take a simple model and create three categories: retail, wholesale, and sales (company sales). One of the things that we know immediately is that consumers are different people. They don't think the same, they don't act the same, and it's seldom that you have a product that everybody sees the same way. Therefore, one of the things you do in marketing is define an audience; that is, find those most likely to buy your product. But you've got to communicate with those people. Now, if you have some products that have a certain utility, the most important thing you've got to do is get it to the people who require that service. After you reach those most interested or in need of the product, the product itself becomes the most important aspect of selling.

Then, there are some products that are of such a nature that they don't fit easily into this normal distribution pattern. Here you want people to know that a certain product is available, and if it meets some personal desire they will purchase it. To a certain extent advertising can be looked upon as an education. Let's say that I've got a product and it is the kind of item that appeals to a single person who is over 30 years old and makes above $30,000. I ask myself if I should create a sales force to visit all the wholesalers, who, will themselves, reach all the retailers. And should I develop and deploy advertising that will reach a specific type of person? I also wonder whether the retail shops effectively cater to people with the customer profile? If so, I would have part of my marketing function pretty well accomplished. I could distribute my product through the wholesaler and the retailers, who increase the cost to the public by adding their profit margin.

But, I can lessen the cost if I bypass the wholesaler. To do this, I need the list of people who fall into the customer profile, so I can go to them directly. Since we've already determined that the likelihood of their wanting a product like mine is relatively high, I might be doing them a service by letting them know that my product exists, while selling to them at a lesser cost than the wholesaler-retailer route. Perhaps this approach would also make it possible for persons not to have to travel so far to purchase the product, thereby saving energy as well.

The point I want to make here is that I can go into the direct mail business with the best interests of the consuming public in mind because what I'm trying to do is to provide them with my product in the most convenient and inexpensive way possible. However, the key to all this is that I've got to get my hands on a good list of names. The alternative is to use mass advertising, such as television. Granted, your exposures per dollar on television are cheaper, but you're reaching a lot of people who are not necessarily interested in the product. The manner in which I'm communicating, through direct mail soliciting, is not necessarily offensive. But the message might be offensive, which is true of all advertising and communication.

Student: How about looking at it this way? By putting more of this junk mail in the system, the mail carrier has got to carry more, which puts a bigger load on the Post Office Department and jacks up the rates to everybody that isn't interested in your product.

Mr. Barabba: You use the term "junk mail." Let's look at it another way. If I've conducted good research and I'm reaching the right people and offering them a specific message that is of

interest to them, do you still call that junk mail? I would imagine the people who learn of a product that satisfies a need don't think it's junk. In fact, some people call it direct advertising.

Student: If it's not junk mail for that target group, it's mail that has to be handled by the system, which takes up time and has to be carried to a certain percentage of people that don't want it.

Mr. Barabba: Either I've made an assumption or I have hired a survey research firm which has interviewed those people, shown them the product, and asked what they thought of it. If some of them told me, "I really like it," and some of them told me, "Who the hell needs it?" then, in a sense, I am a "bad guy" by telling everybody, even those who don't want it, about this product through a mass communication medium like television?

Student: The real issue is the invasion of privacy. Personally, a telephone solicitor or someone that comes to my door is invading my privacy. When I need something, I can go out of the house and get it. I don't want to be interrupted at someone else's convenience. For me, the direct mail business is not so much of a hassle, because I pick up the mail when I'm ready, and I have the option of reading it or not reading it.

Student: I don't want people to know my address. I don't like people to know my telephone number, only those whom I choose. I have an unlisted number, but I know that number is given out because I get various phone calls from people soliciting things.

Mr. Barabba: I'll tell you how that is done. Let's say one wants to conduct a telephone survey of Los Angeles County. He knows that 30 percent of the numbers are unlisted. What he does is find the number of people on each exchange. Let's say the "367" exchange has got 500,000 people, and the "354" exchange has got 400,000. So, we draw a probability proportionate-size sample and say the 367's are going to have more interviews in them than the 354's. Then, all you need is the "367" series. Starting at 0000 to 9999, you draw randomly from the four digits. Whether your name is listed or not, the likelihood of your number turning up is proportionate to the number of people on your exchange.

Student: How do they know your name?

Mr. Barabba: If they know your name, that's a different story. Then somebody obtained your name and your telephone number together.

Student: So again, we have some undisclosed source giving my number out.

Mr. Barabba: That is correct. Today, legislation is being considered that would require persons using any individual's name for a purpose other than that for which it was originally supplied to let the individual know about it. Right now this legislation would affect only agencies of the Federal Government, but some would advocate that this rule should apply to the private sector as well. If these sorts of rules were put into effect, the cost of acquiring the list would be much greater. We, as a society, will have to ask ourselves what privacy is really worth. I don't think that the marketing profession has any idea of what it would cost to institute the sort of privacy protection that I've been describing.

Student: It seems that you are arguing that the cost of reporting unauthorized uses of an individual's name and other personal data will make it impossible to distribute goods economically within our market-oriented society. It sounds like the individual doesn't really have a choice about personal information being used. Is this unavoidable?

Mr. Barabba: Not at all. If the legislation I've just been talking about is passed into law, the individual will be very well protected as far as unauthorized usage by the Federal Government goes. It is already the case that individuals are protected as regards the private sector and its credit reporting activities, at least to the extent that misusing credit information about an individual is illegal. Soon there will be legislation concerning the improper uses of medical records. But whether there should be more restrictions placed on our market economy in the name of individual privacy is open to debate. We absolutely must weigh the alternatives.

It seems to me that we have to become aware of the fact that in our society the distribution of goods is based firmly on a system which requires a free flow and exchange of information. I would favor a more efficient way of reaching individuals that doesn't intrude on people's privacy. Remember, part of the economic system is also the right to choose, the right of personal selection. I don't think anyone here wants to move toward a system that would offer less choice or variety in goods and services, and yet that is exactly what restricting the flow of information could do. So, I hope it is clear that the problem we have been talking about, that is, direct mail advertising and the efficient allocation of goods and resources, is by the very nature of our system interwoven with the right of individual privacy.

Student: I think this is part of the problem of identifying social indicators, because there is no way to measure the cost to society of certain actions. I'm looking at it from the consumer's standpoint. I, personally, would not know how to judge the cost of giving up a little more of my privacy.

Mr. Barabba: The real cost to the consumer of the product will rise or fall depending upon the most efficient communication system. There's another problem. Using the direct mail method, you have an idea of what your maximum sales might be based on the number of people contacted. So, you produce in a quantity directly related to this particular form of distribution. If you go the television route, your key is to sell as many units as possible at the lowest possible price. Society may not need as many units as you hope to sell. Why squander limited resources, raw materials in this case, to build an unrealistic quantity of products when they could be used for more important things?

Student: Wouldn't it be better, if you wanted that kind of message by mail, to sign up requesting it and tell them how many kids you have, and if you're married; all the particulars. Then other people don't have to put up with it.

Mr. Barabba: I would favor another way. Rather, I'd inform the solicitor, "I have absolutely no need for this kind of product and whoever sold you my name didn't know what he was talking about." I'd prefer the free enterprise system work that way. What

I'm telling him is that the guy he bought the list from sold him a bill of goods.

Let's talk about the concept of "future shock" from the information point of view. One of the points relevant to this group was the impact that all of this new information, and the volume of information, has on individuals. How do you identify that problem?

Student: I would say that's an important point. I don't see change per se as the problem, but how we as individuals respond to change. I think one central issue is the belief of most individuals that they control their own lives to a certain degree, or at least trust those people who do control the things the individual can't. You have to make a decision about some things. You have all this information and no time to undertake the methodical, scientific consideration of the information that many of us have been taught is the rational process. I think you just give up eventually and just throw it all in. Voters elect Congressmen who make foreign policy, and these men should theoretically know about what's happening in Cyprus and all over the world. You just can't know everything. I think that's one of the major problems.

Mr. Barabba: It's the plight of the Ancient Mariner, you know, "Water, water everywhere, nor any drop to drink." It's that single piece of data that you need that really becomes most important.

Student: In terms of the cost, I'm just wondering if the decennial census in some way might be outdated from a cost/utility standpoint.

Mr. Barabba: There's a lot of discussion that takes place about your question. For example, if we are interested only in the number of people, there are more efficient ways on an intercensal basis to estimate what the population of the United States is at any given point in time than to actually go out and count it. In addition to that, we can give it to you as local area data, as well.

The problem is that as soon as you tell people what the count was, the next question they ask is, "What was the composition of the count?" Let's say you could get age, race, and type of abode that a person lives in. Is that enough? To explain some phenomena, two kinds of information are enough. For others it takes more. For example, to get local-area data about education, a sample of the population is not as efficient because we may interview only two or three hundred people in an area like Los Angeles. I wouldn't be comfortable with the confidence interval for a survey of two or three hundred people in a large metropolitan area, particularly if the county of Los Angeles wants to know the difference between Los Angeles and the rest of the large cities.

At this point, large scale census-type data become more important, especially if you have to break down a large universe by geography. If you're interested in national aggregates, it's the worst way to get information, it is so expensive and such a slow process. On the other hand, the Current Population Survey which measures unemployment, where timing is more important than anything else—a survey we complete in 15 days—is done on a sampling basis rather than by complete enumeration.

Student: What's happening in terms of getting more information to the individual? We're creating so much information, yet we seem to be talking about making information available to the public official or special groups. But the individual has sort of been swept away. Is there anything being done to increase the information available to the average private citizen?

Mr. Barabba: During our lunch break, the representative from KNX radio called and wanted to do an interview on what the Census Bureau is doing at the University of Southern California. We had a nice chat. So the press is certainly one means of communicating with individuals. One of the things the Bureau can do is to put our information in more usable formats that are of general interest to the population. We've talked with the library associations about considering libraries as "retail" outlets for census information. We're figuring out ways of developing a dialogue within the library community, so when people raise questions that require census information, the librarians will know how to go through census volumes and point out where each kind of information is located. We also have a potential project under discussion with Oklahoma State University. Through their university extension program, we may attempt to set up a system where their county agents are taught how to use census materials, and not just the agricultural aspects. Then, in each of those small communities when they have to make decisions relative to public administration and things of this nature, a person is available to provide the information to people.

I'm not too sure I can better answer your question, other than to say we're going at it from an educational point of view. We have developed a film about the American people called "We" and another called "Fact Finder for the Nation." These films are now made available to high schools, and we have a person working on a week-long curriculum that a secondary school teacher could use explaining the Census Bureau, the kind of information that's available, and what it tells about the American public.

Student: Aren't we trying to infer that, with the rapid change of technology and lifestyles, to get accurate information or make decisions we're going to require a higher degree of explanation which implies that we're going to have to examine more and more variables, and hopefully, accurately?

Mr. Barabba: Or you find ways of using the variables that you already have more efficiently. Let's talk about some of the things that you have to deal with in your everyday work. Isn't somebody a probation officer? Let's talk about that. What are some of the things you have to deal with in your job? What kind of things do you have to describe about the whole concept of probation or some given part?

Student: As an administrator, you certainly need to know the rate of success in terms of probation.

Success in terms of the offender would be no further law violations; eliminating future law violations; meaningful occupation, being a student or gainfully employed. If they're on probation, it would be adherence to the conditions of the court. Let's say they're paying restitution. Then success would mean prompt and steady payments.

Mr. Barabba: Assume these are success. Which do you think is the most important? If you were limited to one on which to base your whole program, which one would you choose?

Student: If a kid goes in the first time for a narcotics violation and he comes out on probation, he may do dope every day after that and never get caught. That does not show. There's no recidivism in this kid; you'll think he's cured.

Mr. Barabba: But if he was still doing dope, wouldn't he be giving up gainful employment and other things. Thus, the variables are relative to each other.

Student: Most likely.

Mr. Barabba: We haven't really even described what success in probation is. If probation success was related just to recidivism, you would need one variable to describe it, that being whether he goes back in the "slammer." The next question you should raise is whether that is really a sufficient goal to determine success. And I think that anybody who's been in the business very long would say no. One of the ways you can fully describe a phenomenon is to make it quite simple, but that doesn't do the job for you. As you go into the description of a more complex phenomenon, you come to several problems: How many factors are there? How do they relate to each other? Which ones are the most important? That is, should different factors be given different weights?

Let's say there's a big debate going on in your profession relative to what success really means. One thing you could do is to get people who have a good reputation in your area together and have them talk about specific case studies of individuals they've run into through the probation cycle and about the ones that they feel are real success stories. Then you could talk about those. With 10 people around a table talking about 20 cases you can see how many things they agree are measurements of success.

Then you could say, "These are all successes, now let's look at the characteristics of these people along certain lines." You could develop scales of occupation from low to high, gainful employment from low to high, and education from low to high. Then you could run different kinds of mathematical devices to find out the extent to which any of these variables contributes to the thing called success. You can actually develop a formula, and you just run these things through it and say that these are variables that ought to be looked for. You can determine that one or another tends to be more important, because it contributes to the description of success. In an area like probation, that approach may be 10 times better than your current procedures, and for the next decade that may be one tremendous goal.

Relating this to "future shock," with all this information we receive, if we start thinking about our information needs, relative to accurate description of phenomena, you could end up asking for less information rather than more information. Because if you, as a probation officer, ask for all of this information and then some, and you in the health area ask for all of the information you need, we may well find that the requirements overlap and that's helpful, but a lot of time they don't and you'll want a slightly different formula.

At the same time, you have an organization like the U.S. Census Bureau coming out with the big thick books and, in a sense, contributing to the problem rather than solving it. Now, if we can come up with two or three pieces of information with multiple uses, we can solve an awful lot of problems.

Student: You're saying that the more the phenomena proliferate, the less we should know about them if we want to make a decent decision.

Mr. Barabba: No. I'm saying that we should try to understand more meaningfully each phenomenon by finding those characteristics that best describe it. In a sense, you know more about it because you are dealing more fully with the meaningful measures rather than "thumbing through" all possible measures of the phenomenon.

THE RIGHT OF PRIVACY AND THE NEED TO KNOW

Vincent P. Barabba, Director, U.S. Bureau of the Census

Recently, while reviewing a Census Bureau project to design an ideal census for the year 2000, it occurred to me that we are now, in August 1974, closer to the year 2000 than we are to the end of the Second World War. That's hard to grasp, because the year 2000 sounds so far in the future. It also occurred to me that in just 10 years it will be 1984.

Nineteen eighty-four. I'm sure as we get closer to that year there will be another printing of George Orwell's powerful work about what totalitarianism can do to the human spirit. Recently I took my copy from the bookshelf and reread it. Even though it had been a long time since I had picked it up, several things remained clear in my memory. For instance, the slogans of the ruling party: "War is Peace," "Freedom is Slavery," and "Ignorance is Strength." Most of all, I remembered the thought police monitoring a person's every movement on two-way television screens, and the saying "Big Brother is watching you."

The book's very title has come to stand for anything which infringes or conflicts with the natural desires and rights of the individual. To put it another way, "1984" stands for dehumanization, regimentation, and the lack of free choice.

The noted Soviet author Aleksandr Solzhenitsyn has written:

> As every man goes through life he fills in a number of forms for the record, each containing a number of questions . . . . There are thus hundreds of little threads radiating from every man, millions of threads in all. If these threads were suddenly to become visible, the whole sky would look like a spider's web, and if they materialized as rubber bands, buses, trams and even people would all lose the ability to move, and the wind would be unable to carry torn-up newspapers or autumn leaves along the streets of the city. They are not visible, they are not material, but every man is constantly aware of their existence . . . . Each man, permanently aware of his own invisible threads, naturally develops a respect for the people who manipulate the threads.

And that's what I would like to talk about today—the relationship of the natural desires and rights of an individual living in our society, specifically the right of privacy, with the legitimate need of society to collect information about the individual, in order for society to understand itself.

The specter of government intrusion into the affairs of individual citizens has always been a highly emotional subject and, unfortunately, one often discussed in the framework of emotional newspaper headlines. Events of recent years have brought the issue into the forefront of public debate. But at the same time the highly emotional character of events such as the military surveillance of civilians, wiretapping, and political espionage have tended to obscure the nature of a whole series of privacy-related questions. Emotionalism has reduced this very complex problem to a simplistic assertion that each man has an inalienable right to privacy and no more invasions of that privacy should be allowed. Yet, this dogmatic approach obscures and hampers objective debate, as well as decisionmaking, concerning aspects of individual privacy and confidentiality that collide with society's need to know.

For example, in various speeches and congressional testimony Senator Sam Ervin, a most distinguished constitutional lawyer and advocate of an individual's right of privacy, has used as examples of unlawful or questionable government intrusion the compilation by military intelligence of dossiers on civilians, and also the questions asked in the decennial census and other surveys by the Census Bureau.

While I know that Senator Ervin understands the distinctions between these activities, the context of his speech does not reveal the differences between the collection of information for administrative purposes and the collection of information for the publication of anonymous statistics. Failing to distinguish between types of data collected and their purposes does much to contribute to the headlines that cram my files, such as "Reversing the Rush to 1984," "Who Knows? The Computer Knows," "Big Brother Society Feared," and "Federal Data Gathering Like Octopus."

Many of these articles mention the Census Bureau in a catalog of "sinister or potentially sinister" data-gathering agencies. So far, the Bureau has not been directly identified as a culprit. But some articles and many public statements leave the distinct impression that it has that potential. This implication all too often occurs because the potential danger is viewed in isolation. Current Bureau procedures for confidentiality are never mentioned. Bureau history as to confidentiality of data is not considered. The "watch-dog" nature of the Congress is not raised. Many more aspects of the problem must be considered before one can draw conclusions concerning the abusive or potentially abusive nature of a data-collection system. And I will attempt to deal with these later in this talk.

But, statements by elected officials, and headlines like those I have mentioned, make it apparent that regardless of the actual situation there is a clear public concern that all is not as it should be. The public reads reports of government officials abusing data collected about individuals. The Census Bureau is a collector of information about individuals. The public is concerned that the Bureau should not abuse such information. Part of the public may already believe that such information is abused. Regardless of how one wants to categorize public feelings concerning data collection by the government no one would deny the great and growing anxiety that there is abuse of data—that people either as individuals or in the mass are being manipulated.

Anxiety

I see two types of anxiety reflected in these headlines. One is on the part of the individual, the other by society.

Let's look briefly at society. If one were to generalize about the "data-collection" concerns of society or large groups of individuals, this concern might be broken into two parts.

First, from the myriad of advertising and mass media campaigns, the fear arises that unconsciously the public is coerced to act in ways actually opposite of the individual's best interest. That is, that stimulants are being applied in a scientific and ordered fashion to cause individuals to behave according to

the wishes of the anonymous "they" of corporate America and Madison Avenue.

Much of this concern has arisen since, and is no doubt linked to, the birth and growth of television and computers and the fact that they have become part of everyday America.

It has even been alleged that political candidates are being disguised in order to "sell" them to the public—a public that would have rejected them out-of-hand had it not been for the so-called magic of electronics.

By the late 1950's, computers and television had become part of the everyday scene in America. Vance Packard's book **The Hidden Persuaders** crystallized a fear that had been forming for some years—that increased knowledge about society would lead to the ability to manipulate the public mind. Words such as "brainwashing" and "subliminal advertising" were current on the cocktail party circuit.

Raymond Bauer, writing in the **Harvard Business Review** a few years later, put this fear into perspective. He said that the fear of manipulation is an old one on the part of society. He pointed out that superstitions such as possession by demons and belief in witchcraft have been replaced by fears of the unknown potential of new technological inventions.

But, Bauer went on to state that those who desire to manipulate the public mind are always one jump behind the public mind. Bombarded by television, "education," and the experience of living in a technological society, you and I become more sophisticated, and our resistance to persuasion increases. A case in point is the consumer movement. Who could have foreseen such a powerful grassroots phenomenon just a few years ago?

The second concern is more subtle and further from reality than advertising's efforts to control a sophisticated public.

In Imperial Rome the politicians discovered that games and circuses plus free grain distracted the masses. Therefore, no formidable public opinion ever arose on a variety of extremely important but remote issues such as land reform or the decline of the senatorial system.

Today, fears have arisen that aggregate data theoretically compiled to show social needs, desires, and minimum levels of fulfillment will allow manipulators to promise what the people want to hear while providing the minimum desired—the "games and circuses" for the people. In other words, by using statistical data the politician is able to pacify the voter while doing his own thing for his "special interests."

This sort of argument ignores a very fundamental truth about the American Government's statistical programs. That is, simply, that every possible effort is made to produce low cost statistics, available to all groups within our society, so they may analyze and use them in decisionmaking. Everyone admits that statistical information used properly is one of the best tools available for decisionmaking.

At a recent conference of German and Swedish scholars in Stockholm, it was suggested that one of the finest defenses against the possible manipulation of society was the use by interested groups of the same statistics to influence the manipulators. Some of the more successful actions of consumer advocate Ralph Nader certainly serve as examples of putting this advice to good use. So long as no one group holds a monopoly on the statistical information produced by the Bureau and other agencies I cannot imagine the people of our country becoming mere "pushovers."

Now let's look at the individual's personal concerns. At the top of the list is the question of the individual dossier. The potential abuse of information collected for various administrative purposes exists when combining it, without the individual's knowledge, into a hidden and unalterable record of past performance, to be used possibly for questions of job tenure, promotion, or financial loan suitability.

If there is an area which requires our attention this is it! We must prevent information collected for one purpose from being used later in a way which will injure either the individual or his family. In 1973 the Department of Health, Education, and Welfare released a widely acclaimed report dealing squarely with the above problem and recommended that there be no administrative record kept of which the data subject was not aware, nor could data collected be used for any unstated purpose without the permission of the data subject. At the moment there are several bills before the Congress that would legalize some of the HEW recommendations.

And this is a problem that we all face; there is enough truth in the average man's fear of manipulation that the fear is hard to allay. But, almost without exception, the abuses discussed concern the use of individual data collected for administrative purposes and action against specific individuals, such as tax records.

Also on the list of the individual's personal concerns is the "mailing list." Many persons are annoyed by the presence of their names on mailing lists and consider this method of marketing an invasion of their privacy.

I sometimes play a game when I order something by mail. My middle initial is "P," but I often put down another letter to determine if the company I buy something from sells or uses my name for another purpose. Actually, I don't mind being advised by mail of services and products which I might be able to use. I just want to know how somebody got my name.

The fear of the misuse of personal information is further exaggerated by the popular image of the computer. Spy movies and television have fostered a public overestimation of the abilities and applications of the computer. Together with recent headlines, this has led to fears of an ominous national data bank which would store every facet of our personal lives for instant retrieval by any government agency.

Let me state that for this fear to be realized—for us to move that close to George Orwell's nightmare—the United States would have to abrogate not only current law but its entire democratic tradition. Let me emphasize this by quoting a key portion of a paper written by Otis Dudley Duncan which concerned plans for the 1970 census.

> . . .in this country we have proved that a statistical system can incorporate rigid safeguards of confidentiality. The institutionalization of these safeguards has proceeded to the point where it is inconceivable that they would break down, except in the catastrophic event of a breakdown in our whole system of institutions protecting the rights of the individual. In the case of such a catastrophe, my guess is that much more direct ways of infringing these rights would be found than that of making inappropriate use of statistical records secured ostensibly in confidence.

Nevertheless, the public conception of the computer is often that of a villain, because of either its potential for abuse of personal information, or irritating arguments with department store computers about incorrect billing.

Yet, I think the computer has made a profound contribution to the public good—and done it so well we take it for granted. One example is the millions of checks the Social Security Administration issues each month. Those checks simply wouldn't arrive as fast or as accurately with manual processing. Furthermore, as regards our topic of privacy, the advent of the computer has done a great deal to protect an individual's privacy, as I hope to demonstrate a little later in this talk.

I have no objections to the press or elected officials investigating the potential for misuse of any system containing information on our citizens. However, I am very concerned that, as real culprits are identified, the Census Bureau will be tarred with the same brush. Yet, there has been no real investigation of Bureau procedures, its standards of privacy and confidentiality, or the importance of the societal need that the Bureau's products fill. People are largely unaware the Census Bureau is the only government or private agency that collects data on every household in America. Nor, does the public at large realize what the Bureau does to ensure the privacy and confidentiality of the respondents.

Because of the concerns I've expressed, I would like to detail the Bureau's philosophy on the citizen's privacy and confidentiality of the information it collects.

Logic of Information

We, at the Census Bureau, believe our mission is to gather accurate, timely, and complete data from individuals, businesses, and governments, with a minimum of intrusion into their privacy, and to make publicly available general, anonymous statistical summaries of that data, specifically designed to respect the confidentiality promised each respondent.

First, we should address the question of whether we need a Census Bureau at all. What would happen if the Bureau closed down or greatly restricted its collection of data? Without census statistics much of the planning in the public and private sectors would have to be based on general assumptions which would not be verified.

You may ask what sort of uses are census statistics put to? Bureau-generated figures include those used to determine the unemployment rate, Federal revenue sharing allocations, the gross national product, characteristics concerning the low income population and minorities within our country—including figures on birth, education, and unemployment among these subgroups—projections of population, birth expectations, changing age patterns of the population, the balance of U.S. imports and exports, and crime victimization characteristics by socioeconomic status, to name but a few. I should add that all these examples do not include the many uses of the decennial census.

My examples are intended to emphasize the statement that without accurate and timely census statistics decisionmaking both inside and outside the government would be handicapped.

It is probably obvious to you, and I would be less than candid if I did not say, there is an inherent conflict in gathering data from individuals. That conflict is between the amount of privilege granted the individual to decide whether to disclose information about himself and society's use of mandatory processes to obtain the information it needs for valid purposes.

I have not mentioned the individual's right to be let alone because I am not sure that, by itself, such a right exists. The choice of individuals to live in a group, clan, or society implies a certain obligation to that group. If an individual obtains benefits from such a living situation there is little doubt he will be expected to contribute to the advancement or continuation of that group. Few groups can be identified where an individual is allowed to reap the benefits of society and yet does not contribute in some way. The obligations of dwelling in a highly complex industrial civilization are perhaps even greater than ever. There is little doubt that the individual as a single human unit derives benefits from dwelling among his fellow men.

For instance, no one forces a person to apply for a driver's license, to register to vote, to obtain a passport, or to practice a licensed profession. But if a person wants to do any of these things, he or she must provide certain information which society has deemed necessary to establish qualifications. These are basic steps of order that society takes to protect itself.

What, then, should be the price charged an individual for the services and benefits, both realized and potential, he receives? I would suggest a broad definition which would require each person to cooperate as fully with those persons who represent the institutions of society as is necessary for the smooth functioning of the society. Society, in return, must meet most of its responsibilities to the individual's needs, most of the time. To do this, those officials and decisionmakers responsible for the orderly operation of the socioeconomic conglomeration we call "the state" must have accurate information. They must get this information from the individuals of the society to determine and evaluate needs, demands, trends, and a variety of facts indispensible to the intelligent running of such a system.

Basic to this discussion then is the question: What is the right of privacy? Is that right something that can be brushed aside anytime a governmental organization believes it needs a new brand of information to assist the individuals? The right to privacy is indeed a very easy term to evoke, but a very difficult one to define.

American legal and academic scholars have wrestled with the problem of privacy ever since 1890 when Samuel Warren and Louis D. Brandeis, later a famous Justice of the Supreme Court, published in the **Harvard Law Review** their well-known article entitled "The Right To Privacy," which they defined as a right to be let alone.

Warren and Brandeis developed their quasi-legal definition of privacy by viewing it as a "right" to be secure from undue interference with one's person, papers, property, or thoughts, having traced its development through the history of common law.

Today, several Western European nations have commissions reviewing existing privacy safeguards and planning additional measures in order to protect the individual's desire and need to be let alone. I have already mentioned the proposed American legislation intended to deal with this matter. The Swedish legislature has recently enacted a data law designed to cope with problems of individual privacy. Some German states have for several years employed a data privacy and confidentiality ombudsman whose task is to act as an independent investigator, reporting directly to the elected officials.

More recently, German psychologists have attempted to define privacy as those areas of individuals' lives in which they can act without having to fear that information may be passed on in a way dysfunctional to themselves. Thus, Muller and Kuhlmann have added to the privacy concept the idea of selective transmission of information, be it to family, friends, one's doctor, or a government organization. They view privacy in the modern

sense as including the selective transmission of information about one's self.

For the purposes of our discussion let's accept the notion that the word "privacy" refers to a sphere in which the individual is able to decide what will be transmitted to others. In addition, this sphere also includes certain confidential relationships where the individual believes that information transmitted, either by choice or compulsion, will go no further than the parties to that relation, and will only be used for the purposes that were identified at the time the information was imparted. Given this notion we can see that the term "privacy" does not mean a sacrosanct area where no questions can be asked; that is only part of the definition. On top of that we have a larger area where questions may be asked on a voluntary or mandatory basis, but the individual understands and believes the answers he gives will not be used for other than what he has been told or perceives.

The respondent's "security" of belief, based on the promise of the receiver, stated or implied, that information will only be used in specified ways, creates a bond which I would call a "confidential relationship." To me, confidentiality must be considered when anyone attempts to assess or balance individual privacy and society's need to know. But, what exactly are confidential relationships?

Census confidentiality relates to individual information in the hands of institutions. It is important to reinforce the distinction between personal information gathered for statistical purposes as opposed to that collected for administrative tasks. The information could be the same in both cases, but administrative records are intended to affect the individual directly, for instance, those used by the Internal Revenue Service or the Social Security system. Statistical records, such as those maintained by the Census Bureau, do not directly affect the individual.

All that I've really been trying to point out is that "privacy" doesn't exist in an absolute sense anymore than freedom does. There is no doubt that our constitution is less than specific about all the aspects of individual privacy and, yet, our courts have been able to find several guideposts for dealing with specific cases. As our Supreme Court is called upon to adjudicate constitutional questions pertaining to the right to privacy, we must remember that privacy, like freedom, has meaning only in the context of human society, and our society is rapidly changing. The crux of the issue is this: As American society becomes more complex, we need to know more about ourselves in order to establish priorities and properly allocate our human, financial, and natural resources.

"Real World" Decisions

All of this merely represents our philosophical approach to matters of individual privacy and respondent-Bureau confidentiality. But, none of this goes very far in showing you how the Bureau faces the tough "real world" decisions constantly confronting it.

For example, in the rural style of life that existed in 1790, it would have been hard to justify the government's interest in whether or not a household had its own bathroom facilities. But, today, with society's commitment to eliminate slums and substandard housing, information about sanitary facilities is needed to accurately pinpoint the number and general location of such housing so the taxpayer's dollar is spent wisely.

I've cited to you the question about plumbing because it is one of the many well-publicized examples that critics of the Bureau use to show how meaningless, silly, personal, or unnecessary our questions are. To claim that this census question now constitutes a violation of an individual's privacy strikes me as a rebirth of the "know nothing" philosophy of the 19th century. Put another way it is an argument that the interest of the individual refusing to answer such a question transcends the interest of the society and has priority over public efforts to eliminate slums and promote accurate resource allocation.

But the question of a household's plumbing is not the only example. I don't need to tell this audience that the salaries and pensions of millions of Americans are tied to variations in the cost of living, which is gauged by the Consumer Price Index. However, recently appearing before a committee of the House of Representatives, I was questioned intensely about the census questionnaire which forms part of the Consumer Expenditure Survey, which is the basis for the Consumer Price Index. One member wanted to know why the entry "hair and scalp care for men and boys" was important. Out of context, I admit it sounds ludicrous, but as one component of a family's total spending record, it is important.

The Consumer Expenditure Survey was taken of a scientifically selected sample yielding 17,000 household interviews. As with all the Bureau's current household surveys, participation was voluntary. I should add that despite the fact that the survey was very lengthy and required that the interviewer visit the respondent several times over a 2-year period the Bureau obtained approximately a 90-percent response rate, indicating excellent cooperation. And, the answers of each family are very important, since the 17,000 households represent the entire civilian noninstitutional population of the United States.

As long as responsible Government leaders determine that a detailed picture of family spending is essential, there is no other way to obtain it than to ask such detailed questions.

Another example is the census question about how a person gets to work. In 1970, some people felt this was none of the Government's business. But when the energy crisis hit with full force, the only complete statistics about the Nation's commuting habits came from the total of each person's answer to that question. The Bureau was able to respond with statistics about the number of drivers and passengers for each metropolitan area—figures which showed that a total of 26 million persons drove to work alone each day.

I've given you a few examples of questions that some people feel are an unnecessary invasion of an individual's private sphere and I've tried—briefly—to explain why they are relevant and necessary.

I think that Senator Sam Ervin in his role as Chairman of the Subcommittee on Constitutional Rights summed the problem up well when he said:

> Somewhere a balance must be struck between the individual's desire to keep silent and the Government's needs for information. If it is proved necessary to invade certain rights, clearly it is the constitutional duty of Congress to establish precisely how and under what circumstances this may be done.

Congress has been doing exactly that for almost a century. Since the act which provided for the 1880 census, the laws protecting the confidentiality of the information given in response to census questions have been progressively strengthened. While, at the same time, what the Bureau can collect has been defined as well.

This was not always the case. To begin with, until this century there was no permanent census organization. Federal marshals supervised the enumeration from the first census in 1790 through the count of 1870. In fact, the rules for the first five censuses required that the marshals post copies of the list of names in two public places in their districts.

Between 1840 and 1870 there were no legal restrictions, but census takers in the field were instructed to treat all information they gathered as strictly confidential. I don't know if the urge to gossip was stronger than those instructions, but beginning in 1880 the law required all enumerators to take an oath not to disclose any personal information. Oddly, this requirement did not extend to their supervisors. That loophole was closed by 1900, when all census employees were made subject to a $500 fine for violation of their oath.

In 1902, the permanent Census Bureau was established. It had become apparent the need for statistics was a continuing one. Also, the size of the job was such that a full-time, trained staff was much more efficient than setting up and disbanding a new organization every decade.

Up until 1910, census law required the Director to furnish on demand to Governors or heads of municipal governments certain parts of an individual's return—the name, age, sex, birth place, and race. The act for the 1910 census changed that wording to read that the Director could, at his discretion, furnish information for genealogical and other proper purposes.

For the Bureau, 1910 also marked the start of another tradition—the presidential proclamation. The one issued by President Taft told the American people their replies to census questions were to be used only to compile general statistical information, and that their answers were protected by law. In part, it read:

> The census has nothing to do with taxation, with army or jury service. . .or with the enforcement of any national, State, or local law or ordinance, nor can any person be harmed in any way by furnishing the information required.

The current law under which the Census Bureau operates is Title 13 of the U.S. Code, most of which dates from 1929. This law is very specific when it comes to personal information. It requires that information obtained from an individual be used only for statistical purposes. It also requires that published data be in such a form that it is not possible to identify an individual or a single business establishment. The law stipulates that no one other than sworn officers and employees may have access to individual information, and each census employee has signed an affidavit of nondisclosure to uphold the law.

The current law still allows the Director at his discretion to provide copies of individual information for genealogical and other proper purposes. The key word here is "discretion." Over the years, the application of this rule has become restrictive rather than permissive.

In current Bureau practice, the term "confidentiality" represents nothing less than a clear extension of an individual's right to privacy. I think the best way of showing this is to review the Bureau's track record regarding the confidentiality of individual data.

Track Record

Until recently, most of the Bureau staff assumed that individual information collected had always been held in strictest confidence. I must report that this has not always been the case. But looking at the way we did things in the past, and comparing them with today's practices, I am even more certain that our current position is a very strong one.

Between 1900 and the mid-1920's, there were authorized releases of individual data which were then considered proper; today they would cause a storm of protest in the press, in the courts, and in Congress. As far as we know this practice caused no such outcry then, although complete records do not exist.

We do have some information on one case which demonstrates the type of situation in which it was considered proper in the past to release data about individuals. This release occurred in 1918, during World War I. Congress had passed a war powers act, presumably the basis for an extreme use of census data. Information about individuals was given to the Department of Justice for use as evidence in prosecuting young men who claimed they were too young to register for the draft. While we do not know the exact circumstances surrounding the release, we do know that personal information for several hundred young men was released to courts, draft boards, and the Justice Department.

The Bureau stopped such releases during the 1920's, a position which was made official in 1930 by an opinion from the Attorney General. His opinion said that even the name and address of an individual was confidential.

At about this same time, the Secretary of State asked for data about individual farms in Stevens County, Wash. Clouds of sulphur dioxide from a smelter located across the border in Canada had caused extensive damage to crops in the United States, and the matter had been handed over to an international tribunal. The Census Bureau refused to release the information, and the tribunal decided not to press the point, even though it felt it had the necessary power. The reason? It would have caused the U.S. Government to breach a promise it had made to its citizens as well as to violate the U.S. law of census confidentiality. The Census Bureau did provide aggregated county data which allowed the court to award damages to the Washington farmers.

Now we jump to 1941. It's hard to imagine now but, with World War II underway, there was near hysteria about the Japanese-Americans living on the West Coast which led to one of the most embarrassing moments in U.S. history, the internment of large numbers of these loyal Americans. At the height of this feeling, the Secretary of War requested the Census Bureau supply the names, addresses, and ages of all persons of Japanese extraction living on the West Coast. This time, in spite of the national emergency, the Bureau held to its position on confidentiality of individual records and refused. However, the Bureau did supply summary data at tract level, but not individual data. I should add that today tract level data is part of the regular publication program of the Bureau. But, as in 1941, no individual disclosures, even by implication, are allowed.

In 1947, during the rising concern about possible Communist infiltration and sabotage, the Attorney General requested information from census records about certain individuals for use by the FBI. Again, the request was denied.

A loophole in the law turned up in a case in the early 1960's when the courts ruled that file copies of census forms not kept by the Bureau could be subpoenaed. This resulted in Congress amending the law to extend census confidentiality to include even copies of census questionnaires which are kept by businesses for their own files.

There's a technological aspect of the Bureau's history that I'd like to mention as well. Herman Hollerith, an engineer who had worked as a special agent in the 1880 census, became interested in the problem of how the volume of material gathered in the census was to be processed. After some experimentation he invented the punched card system for recording and tabulating the census returns. Even in its earliest stage of development, the Hollerith system speeded tabulations to such an extent that its merits were demonstrable before the 1890 enumeration began.

The advent of this new system had dual implications for the question of confidentiality. On the one hand, it removed the actual census return one step farther from human statistical processing. On the other hand, it made possible the collection of even more information on individuals. It is probable that the Hollerith system enhanced the anonymity, and thus the confidentiality, of census data. Technologically it was the forerunner of modern, computerized recordkeeping, which can provide considerable confidentiality for respondents.

Briefly, that is a summary of how confidentiality grew to be an integral part of census taking. Keeping that information in mind, and my earlier remarks about the generalized fear of the computer, let's look at how a modern census is taken and processed.

Modern Census Taking

As you know, we have increasingly utilized the U.S. postal system. In 1960, forms were mailed to each household and were picked up by enumerators. For 1970, the forms were again mailed to all households. But those people living in larger metropolitan areas returned their forms by mail. This meant that in about three-quarters of the Nation's homes personal information did not have to be given face-to-face to a neighbor or a stranger. In Great Britain, a 1973 parliamentary paper dealing with the security of the census of population indicated that the Council of the Royal Statistical Society viewed as a problem having to give personal information to someone who knew the respondent.

After all the forms are collected the data on them must be transferred to the computer for tabulation. It used to be that the data on each form was manually transferred to punchcards, and the punchcards fed to computer tape. Now, we bypass this laborious process. The forms are microfilmed and returned to storage. This is the last time each original form is handled until it is destroyed.

The first page of the census form is not microfilmed. This page has the address of the household. So the rolls of microfilm, which have names and personal information, contain only a geographic code relating that information to the block on which the household is located, and the address register is maintained in a separate file.

Another sophisticated machine transfers the microfilmed information onto computer tape.

Even this is not enough to guarantee that a person could not be identified in the statistical summaries. Some areas have such a small population that it would be possible, by deduction, to know whose characteristics are in the tables. Our computer program is set up to suppress any characteristics that would enable an analyst to identify individuals. So, as I've said a couple of times already, you can see how the computer is a direct asset to contributing to the confidentiality of the information collected. The Bureau is able to accurately and rapidly produce detailed statistics, not possible if the editing of potential disclosures had to be done by hand.

We are examining other techniques for protecting confidentiality. These include rounding numbers to the nearest 5, and a "random noise" system, in which values of one and negative one are scattered throughout the tabulations, balancing to zero at certain geographic levels. Such a system would have no substantial effect on statistical analysis.

When it comes to suppression of data from the economic censuses, even the cutoff points are confidential—because that information by itself could be used for deduction, since the numbers involved are so much smaller than population figures.

I also should mention here the Public Use Sample established in 1960. These are not summaries, but individual census records minus certain data which ensure that the individual cannot be identified. The smallest area identifier for which these records are available is 250,000, and even then certain data have been truncated to avoid identification. An example would be extremely high salary figures, for instance, everything over $50,000 is simply marked "$50,000 and over."

These samples have proven of great value to the academic and business communities for research and for determining if special tabulations would provide the summary data desired.

When the tabulation of a census is finished, the original paper forms which have been stored in guarded buildings on a Government facility are destroyed. They are shipped in sealed boxcars and recycled, with Bureau officials watching until they drop into the pulping vats.

That leaves the microfilm. Where does it go after we are finished processing the data? The rolls are sent to the Personal Census Service Branch in Pittsburg, Kans., which we commonly refer to as the Age Search Service. This is a unique self-supporting operation which has helped millions of people. Every day the Bureau receives about 1,300 requests from people who need to verify some item of information about themselves. Most are for substitutes for birth certificates which either never existed or have been lost or destroyed. People need them to qualify for retirement, for social security, for Medicare, to get a passport, and for many other uses. For a very small fee the Age Search Service will search old census records and issue a certificate which has legal standing.

This service is provided only at the request of the person himself. For example, a son cannot ask about his father unless he has a power of attorney or a death certificate. This operation is the only use made today of the Director's authority to release personal information at his discretion.

Finding information for those who request it is not an easy job. It takes an expert to utilize the microfilm. Since the census is based on addresses, not names, there is no such thing as a master list of records arranged alphabetically by name. For the correct reel of film to be located, the person making the request must supply information about where he lived.

Remember, I said the microfilm for 1970 does not contain both name and address. In order to work backwards and relate name with address, it is necessary to have access to the geographic coding information on the film and the master list of addresses.

The very size of the U.S. population helps to guarantee confidentiality. It took some 5,000 miles of microfilm to process the 1970 census. For us to make this process of working backward any easier would be extremely costly and would, in theory, weaken the protection of confidentiality.

Now, where does the microfilm of past censuses exist? The records of the counts from 1790 through 1880 are accessible to the public in the National Archives. Data in these enumerations were not gathered under laws of confidentiality. The census of 1890 is almost nonexistent, having been mostly destroyed by fire.

The Pittsburg, Kans., unit has microfilm for 1900 through 1960 and late this year will have the 1970 records set up to be able to answer the queries which have been coming in. A copy of the 1960 and 1970 records will be held under security conditions at Jeffersonville, Ind., so that if one copy were destroyed the whole census would not be lost. Incidently, a tornado lifted one corner of the roof of the Pittsburg building a few years ago.

Copies of the 1900 through 1950 records are also held by the National Archives. These were sent to the Archives for storage. However, in December of last year, the Archives opened the 1900 census to limited access by qualified researchers, a move opposed by the Census Bureau. While this access is under controlled circumstances, we feel at the very least it violates in principle the rights of the estimated seven million persons still alive who were counted in the 1900 census.

The law under which the Archives operates says Government records shall be made public after 50 years, unless an interagency agreement stipulates a longer period of time. In 1952, the Director of the Census Bureau and the Archivist agreed that census records should remain closed for 72 years—an average person's lifetime. The Bureau's position is that the 1952 agreement was in excess of the Director's authority and, therefore, is invalid. However, an opinion from the Justice Department did not support our view.

Remember that there was a difference in the status of protection between the census of 1900 and that of 1910. The 1910 count was preceded by a Presidential proclamation—a promise from President Taft which stated: "There need be no fear that any disclosure will be made regarding any individual person or his affairs."

The obvious question is how long does that promise and the law's guarantee of confidentiality apply? A lifetime? One hundred years? Or forever? The Bureau hopes Congress will close this final loophole in the laws relating to census confidentiality.

Congress at the moment has a lot to consider in the area of privacy. Some 100 bills are pending in the House and Senate. The basic question seems to be not whether something must be done to ensure privacy and protect it, but what, and by whom. Four of those bills deal with census information. Eight of them would establish a Federal Privacy Board or some committee or commission as an overall authority. Many of the bills would allow the citizen the right to inspect his own records, correct them, and bring suit for damages resulting from incorrect or misused records.

Much of the "data bank" fear centers on the use of a person's Social Security number as a universal identification number. One bill would expressly ban use of Social Security numbers for any identification other than the retirement system. The armed forces scrapped the old ID serial number several years ago in favor of Social Security numbers, and several States are using these numbers on their drivers' licenses. It is interesting to note that Social Security numbers have not been asked for in the decennial census, where answers are mandatory.

We have asked for these numbers in some voluntary surveys. This allows us to match current answers with information the Government has already gathered, to evaluate the accuracy and consistency of the statistics we produce.

One of the most common complaints from the public is that several agencies of the government ask the same questions. So, where it is feasible, and when authorized by law, the Census Bureau utilizes the records of other agencies. It does this, even though it has the authority to go out and collect the data itself, to save money and to lessen the burden on the public of answering questionnaires. When we do use such administrative records, the information comes under the same rules of confidentiality as if we gathered it ourselves.

While we're on the subject of the burden to the public, let me tell you that the Bureau spends a lot of time and effort in the research and development of questionnaires and techniques of taking surveys and censuses.

For a question to be used, its propriety has to be weighed against the social need for the information. The wording is also very important. A question must result in the maximum of information for society, while causing a minimum of inconvenience for the individual.

Here again, the questions change as society changes. When the Nation was not crowded—when big families were needed to run farms—a question asking how many children a couple expected to have would have been out of line. With today's concern about the size of the population, such information becomes very important.

The concern for the right to privacy was underlined when President Nixon established a blue ribbon panel to review both government and industry practices related to the collection and use of personal information.

At the same time, Commerce Secretary Frederick Dent has directed the National Bureau of Standards to find out how computer information may be made more secure.

And at the Census Bureau, we have established an Advisory Committee on Privacy and Confidentiality, staffed with experts from the entire spectrum of data gatherers and users, to advise us on procedures to maintain and strengthen our record of confidentiality.

You might well ask why we, at the Census Bureau, are so concerned, if our record is good and our intentions are clear. Aside from the moral implications, I'll give you a very practical answer. A census or a survey is only as good as the contract or trust with the people who answer the questions. If the public feels we are not keeping our word that their answers will be kept confidential, or even that the potential for such violation of their trust exists, their answers will not be as accurate or given as willingly. If this occurs on a large scale, the quality of the summary statistics will deteriorate. And if this occurs, the Nation has lost a prime decisionmaking tool, and society will be the loser.

This would be a tragedy! It would come just as more and more decisionmakers in the public and private sectors are becoming aware of how valuable census data is to them. And it would come as the Bureau's main thrust is to increase the utility of the data it gathers.

To the Census Bureau, a promise is a promise. The calendar may read 1984 in 10 years, but I want to make it clear that as far as the Bureau is concerned, 1984 will never come.

In his remarks to the most recent meeting of the Advisory Committee on Privacy and Confidentiality, Secretary Dent said: "I think perhaps the strongest brand name in America might be that of the Census Bureau."

We plan to keep it that way.

MONITORING THE NATION'S HEALTH

Edward B. Perrin, Director, National Center for Health Statistics; Douglas Williams, Chief, Data Use Laboratory, National Center for Health Statistics

"Health care is an industry on which there is relatively little information available. Decisions are being made daily in Washington and Sacramento and other places around the country which involve millions and billions of dollars based on very little information, and suddenly it has occurred to the people in positions of authority that there should be more information and that we should have it now."

Edward Perrin

Dr. Perrin: It's a pleasure to be here today and to have Doug Williams with me.

Before I begin our presentation I think a few general comments are appropriate. By the standards of the Federal bureaucracy the National Center for Health Statistics is a fairly small organization, with a budget of approximately $18 million. It is historically, of course, much younger than the Bureau of the Census and, in fact, an offshoot of the Bureau, though some further background will help you better appreciate that.

When the Public Health Service was established, about 15 or 20 years ago, it was decided that the vital statistics system of the United States should be managed by that organization for the Federal level. This formed the basis of what was to become the National Center for Health Statistics.

Then, about 10 or 12 years ago, Congress passed a very innovative law introducing the National Health Survey, a mechanism for gaining information about the Nation's health.

The National Health Survey and the vital statistics system were merged into the organization called the National Center for Health Statistics which has existed for approximately 12 years. In these 12 years the thrust of the organization has changed remarkably because health has changed dramatically.

Let me tell you where the National Center for Health Statistics exists in the Federal structure. We are in the Health Resources Administration of the Department of Health, Education, and Welfare. We are under the jurisdiction of the Assistant Secretary for Health, as are the agencies of Food and Drug Administration, the National Institutes of Health, the Center for Disease Control, the Health Services Administration, and the Health Resources Administration. The National Center for Health Statistics is in the Health Resources Administration, together with Health Manpower, Health Planning, and Health Services Research. So, besides being in a different department from the Bureau of the Census, our functions are considerably more limited, in the sense that our basic mission is entirely devoted to gathering data on the health of the Nation's people.

Now, there are a lot of ways that an organization can exist within the Federal bureaucracy. One way is to be the figment of some administrator's imagination, which was the case with us for 15 years. However, that makes one very dependent on the administrator and he can suddenly decide that he doesn't need you any longer. So, our first 15 years were very tenuous. Today, we are established by law and have a separate existence so we are definitely going to be around for sometime to come. Our law, Public Law 93-353, established the National Center for Health Statistics as a Federal data-collection agency.

Let me just read to you a part of the law which indicates what it is the Congress thinks we should do. Naturally, there's almost always a difference in interpretation between what the executive branch and the Congress think you should be doing. The Congress believes that it is our function to collect statistics concerning (a) the extent and nature of illness and disability of the population of the United States; (b) the impact of illness and disability on the economy of the United States; (c) environmental, social, and other health hazards; (d) determinants of health (and that, of course, comes close to the question of health indicators); (e) health resources, including physicians, dentists, nurses, and other professionals, by specialty and type of practice and supply of services; (f) the utilization of health care, including utilization of ambulatory health services, by specialty and type of practice, services of hospitals, extended care facilities, and the like; (g) health care costs and financing, including trends in health care prices and costs, the source of payments for health services and, (h) family formation, growth and dissolution. But it boggles the mind to think that any one organization will ever collect any data on some of these things. The idea is, of course, that health is a rapidly growing industry. The health "industry" cash flow totals $100 billion per year at present.

Health care is an industry on which there is relatively little information available. Decisions are being made daily in Washington, Sacramento, and other places around our country involving billions of dollars based on very little information. Suddenly it has occurred to the people in positions of authority that there should be more information and that we, as a society, should have it now. We should have it, for example, this week when the National Health Insurance Policy is being hammered out between HEW Secretary Caspar Weinberger and Chairman Wilbur Mills of the House Ways and Means Committee. As is usually the case, people don't really recognize the importance of information until they come to need it and then discover that it's not available and can't be made available in the time that's required. There's definitely a growing awareness of the necessity for good health data at all levels, and we are attempting to fill this need.

As a data-collection agency, we are interested in a number of very specialized concepts: One is confidentiality of information which, to us, is extremely important. Here, we follow the lead of the Census Bureau because they have been in business much longer than ourselves and have set a good example. The Census Bureau and our Center are the only two data-collection agencies that, up until very recently, had clauses in the laws under which they operate that allowed them to claim confidentiality for

the data they collected. Let me say that without our confidentiality clause the National Center for Health Statistics would be dead. We operated previously under a law which assigned responsibility to the HEW Secretary. The Secretary then delegated the authority derived from that law to our organization. The new situation—having our own law—doesn't change our functions, it only changes the fact that we now have a legal existence that separates our mandate from that of the Secretary of HEW.

The Federal Government has no law which says that it is necessary to collect birth and death data and marriage statistics. The States, on the other hand, have laws which require you to report births. So, the oldest health data system is the vital statistics system. Most of you entered it at birth and continue to deal with it by having to show birth certificates for various purposes, along with the fact that a death certificate must be filed before obtaining a burial permit. That's the way it's enforced in the States. Our center collects these data from each of the 50 States.

The death certificate, which is the backbone of the vital registration system as far as health is concerned, includes some useful health information, demographic characteristics about the deceased, and the cause of death. Now, the cause of death is obviously an important piece of health information. For example, it was the cause-of-death statistics drawn from the vital statistics system that allowed us to draw the inferences about the rise of deaths due to lung cancer, which the epidemiologists associated to smoking. Even so, the system has obvious deficiencies since it is an old system that was set up purely for the administrative purposes of knowing where people were and, as a matter of fact, for getting persons on and off the voting rolls. On the other hand, the system has allowed us to trace, over time, the rise and fall in the prominence of certain causes of death, and we have attempted to infer from these figures something about the causes.

Clearly, the need for health information goes well beyond those figures that we can obtain from the vital statistics system. For example, the National Health Survey is another important mechanism. This is a survey conducted through the Bureau of the Census. The concept behind the survey is that the vital statistics system does not tell us anything about illnesses that do not lead to death. While mortality tells us several things, morbidity is even more interesting and useful because it will tell us about the load on the provider population, on the economy, and so forth. Our Center, through the Bureau of the Census, selects a probability sample of households throughout the country and conducts an ongoing household survey which asks questions regarding the health of the family during the past 2 weeks. Thus, we have, in addition to the vital statistics system, a household interview survey that asks questions about episodes of illness, episodes of hospitalization, costs of hospitalization, disability, etc.

A third provider of information is the Health Examination Survey, in which we draw a probability sample of persons around the country, by geographic location. We haul four trailers into the parking lot of a shopping center and connect them together. We convince the people who have been so fortunate, or unfortunate, as to fall into our sample that they should have a physical examination, and conduct physical examinations on a random sample of the population of the United States. We do not ask for volunteers, and our trailers are simply set up in a parking lot for the purpose of easy access.

Obviously, this is a small sample, approximately 6,000 or 7,000 persons a year. Nevertheless, this tells us a lot about the characteristics of the population that are neither reported in mortality statistics or in the household interview survey. Obviously, we can obtain data in a physical examination that is not available from a survey interview. Take the case of diabetes. How large a problem is diabetes in our population? How can you obtain that piece of information from the existing systems? Do you go through a hospital system? That way you get only the very sick; you don't get the people who never come into the hospital. If you go through a death reporting system you get only those who were sick enough to die. There's just no way one can find out about the load this problem places on the population except to go out and conduct a set of physical examinations on people.

Student: What level of confidentiality do you employ in your dealings with these individuals?

Dr. Perrin: Let me explain the concept of confidentiality. As a statistical data-gathering agency we do not care about the information concerning any single individual. In fact, we're sworn to secrecy regarding the information on each individual. We cannot release it in individually identifiable form.

Let me give you an example. Do you remember the publicity about 6 months ago concerning the minority females being sterilized in some southern States? Well, my organization happens to collect the information on family planning clinics for that part of the country. The Secretary of our Department asked who these people were. I told him that there was no way he could get any information from me about any individual in our data system. This sort of confidentiality is extremely important.

We can do nothing with the information without a written agreement from the individual from whom we gather that information. And usually we get that written agreement. In the rare case, a person will say they don't have a doctor and they don't want anybody to know about their own physical condition. Then we simply tell that person about his or her condition and let him do what he wants.

Student: What would you do if you found someone with active tuberculosis who said he didn't want the information sent to anybody?

Dr. Perrin: There would be nothing we could do.

Student: And he could give his disease to other people.

Dr. Perrin: That's right. What do you think we should do?

Student: But once you see those people you sort of have a moral obligation.

Dr. Perrin: Who's the moral obligation to? Is the obligation to the individual or to society? When these two obligations conflict, how do you resolve them?

The individuals themselves are generally quite interested in the information. The question is what they do about the information. The issue here is, when someone has a condition which is threatening society, such as a communicable disease, what should we do with that information? Should we hold that such information belongs to the individual for

his use, or should we say that in some way that information belongs to the State and we will use it as we see fit?

Student: It belongs to the individual. If he had a right to refuse the examination I think he has a right to confidentiality on your part.

Student: I don't agree. I think it is a matter for the State. If it's a communicable disease that's going to infect the populace as a whole, it's a matter for the State. And I think there should be some agency that you can report it to and then the Public Health Service could follow up on it and try to convince the individual to be treated.

Dr. Perrin: Where do you stop? How do you define what is a threat to society and what isn't?

Student: Do you have curative services in your examination units?

Dr. Perrin: No, we don't.

Student: There is the Public Health Service. And there are parts of the Public Health Service that give shots and so on, and so these people could be referred to such an organization and they would carry the ball.

Student: But, by statute, you're not a policing agency.

Dr. Perrin: Quite correct. The information we collect belongs to the individual. And with his permission we will release it to a physician. But without permission, it's our feeling that the right to information is so fundamental to the individual that we cannot assume the role of a regulatory agency and give this information to anyone else.

Student: In certain ways I can see the possibility of getting around that without disclosing individual names. For instance, when your statistics come out you're going to show a high or low incidence in certain areas, and this information could be used by Public Health Services.

Dr. Perrin: Yes, that's true. That's a perfectly valid use of our data. In fact, we routinely supply aggregate information on many, many health factors.

Student: Can your information be subpoenaed?

Dr. Perrin: No, it cannot be, and that's important. There are very few Federal agencies where that's true. You see, that's the advantage of dealing with a data organization like the Census Bureau or the National Center for Health Statistics. The Internal Revenue Service currently can't get its hands on any of our confidential data. Nobody can. In the Federal Government there are a pair of opposing forces. One of these is the protection of the right of the individual, and the second is the right-to-know law which states that every individual has the right to know what information about him is contained in a system. But more than that, the public, in general, has a right to know what data are involved in any of the Federal systems.

For instance, many reports of other agencies which have been held confidential have been subpoenaed, and the courts have ruled that these data must be released. These reports sometimes contain information about individuals that can be potentially embarrassing or harmful. Unless you have a law such as we and the Census Bureau have, the right-to-know law lays you open to exposure of the information in the system.

This is what the law says: "In the case of information obtained in the course of health statistical activities under Section 304 or 306 of the Public Health Service Act, information may not be published or released in other forms if the particular establishment or person supplying the information or described in it is identifiable, unless such establishment or person has consented to its publication or release in other forms." I must operate under that law, and, it seems to me, we must protect the right of the individual to do with that information what he sees fit. It's a very difficult decision to make.

Student: Would you supply aggregate-type information to private industry for commercial use?

Dr. Perrin: Yes. We do that all the time; so does the Census Bureau. The clothing industry is one of our biggest customers. They like to know about people's foot size, people's body size. We do a lot of anthropometric measurements and the size of the U.S. citizen has been changing over time and we follow it quite carefully.

You see, once the data that we collect—and this is an important "other" side of the coin which I haven't emphasized—is sanitized in the sense that our confidentiality rules are followed, it is available to everyone. Another very important primary tenet of our data-collection agency is that the data collected are made available to everyone who needs them or who even thinks he needs them and the release is not controlled. That's fundamental to our operation. Any data that we collect are available to anyone. To control who can see and use the sanitized data would be quite inconsistent with our mission.

Student: All laws are subject to test, and obviously, this one is sooner or later going to be tested for the interpretation and intent of the legislators.

Dr. Perrin: This is not a new section. This section actually is the same one which has governed all of our work for the last 10 years. The Census rules were tested in court, as to whether data are subject to subpoena.

Mr. Barabba: Yes, and our data's immunity to judicial subpoena was reaffirmed by Congress.

Student: In your position, do you serve at the pleasure of the Secretary or are you protected by tenure?

Dr. Perrin: This was part of the controversy surrounding this particular law. It's difficult to imagine that there can be so much controversy around something called the National Center for Health Statistics, but we generate a lot of heat, though not much light on this particular issue. The Senate believes nowadays that people in my position should be appointed by the President and subject to confirmation hearings in the Senate. That is the case with my colleague, Mr. Barabba.

Student: So, as I understand it, you do serve basically at the

pleasure of the Secretary of HEW, but can he fire you if you refuse to supply him with specific data he requests?

Dr. Perrin: I serve at his pleasure and he can fire me anytime he wants to, but he can't get the data.

Student: I can understand, to a certain extent, why your Center is in HEW; the tools are there, the medical tools, but is there any particular reason for keeping it with HEW as opposed to combining it with the Census Bureau and having a big statistical bureau?

Dr. Perrin: Do you know anything about the statistical organizations in other countries of the world? Canada has something called Statistics Canada which includes all of the statistical activities of the Census Bureau, Labor Department, HEW, and others. Statistics Canada is a centralized statistical operation for its government. In fact, European governments have tended to centralize their statistical activities.

We, in the United States, are somewhat unusual in that we have five major independent statistical organizations recognized by the Office of Management and Budget, and coordinated by the Division of Statistical Policy in OMB. These are the Bureau of Labor Statistics in the Department of Labor, the Agricultural Reporting System in the Department of Agriculture, the Social and Economic Statistics Administration in Commerce of which the Census Bureau is the major component, the National Center for Educational Statistics, and the National Center for Health Statistics.

Recently, the Department of Justice has developed a very important new data-collection activity, but each department has its own in-house system coordinated with the Office of Management and Budget.

Student: I'm sure you'd like to use the decennial census for a lot of your health statistics, and I'm sure that Mr. Barabba is probably saying that he doesn't want to make the form 17,000 pages long.

Dr. Perrin: More fundamental than that, the Census Bureau has the only real sampling frame in the country. That is, they have the most complete list of every person and household in the country. We would like to be able to use that sampling frame for drawing our own samples, but they won't release that information to us because of their confidentiality rule.

As I have said, the Bureau carries out a large amount of our sampling and survey activity. However, we occasionally run into problems. Because we are a health-oriented agency we tend to ask questions, or want to ask questions, in our surveys about which the Census Bureau is quite shy. Recently we sent the Bureau a set of questions we wanted them to ask in our household interview survey, and the Bureau eliminated all the questions that had anything to do with menstruation, bowels, and urine. The Census Bureau did not want to endanger the response rate that it obtains in its own surveys by being identified as an organization that asks personal hygiene questions of people.

Even more important than that, 2 years ago we mounted a major survey called the Survey of Family Growth, in which we selected a random sample of ever-married females and explored the histories of their reproduction and contraceptive use. The reason was because population projections should be based as much on the expected family size, the actual fertility rate, the actual contraceptive practice, and so on, of the population. So we developed a questionnaire and asked the Census Bureau to apply this questionnaire for us to a random sample of the population. They refused to do this for fear of jeopardizing their own data-collection mechanisms by asking questions about contraceptive use, and so forth.

Student: When they conduct surveys for you, do they have to identify themselves only as Census Bureau people, or can they say, "We're Census Bureau people and this survey is for National Health Statistics"?

Mr. Barabba: Yes. If we're drawing the sample off the decennial census, we'll have to identify it under Title 13 of the U.S. Code. Then, we'll say this information is collected under the Center's authority.

Dr. Perrin: When our interviewers go into households they say that they are doing a survey for the U.S. Public Health Service and they have a written document they present to the individual which guarantees their confidentiality. It tells how the data will be used and it's signed by me.

Student: Are there any other ways you deal with sensitive or extremely personal questions?

Dr. Perrin: We are concerned about sensitivity partly because response rates on sensitive issues can drop or answers can be untruthful. One question we ask, for example, is, "Have you ever had an abortion?" The question of whether people will respond to that honestly is a very fundamental one. What we've done is to introduce a new statistical technique which sounds a little implausible but I'll tell you about it. It's called the Randomized Response Technique, which was developed in the last 4 or 5 years, whereby the respondent receives one of two questions at random. As an example, the two questions might be, "Were you born in the month of April?" "Have you ever had an abortion?" Only the respondent knows the question to which he is responding. We know the answer, but we don't know which question it is for. It's rather simple to understand, I think. In other words, we get a yes or no from the respondent and we know the probability that it's question 1 and we know the probability that it's question 2. Furthermore, we also know the probability that that person was born in the month of April. From these facts, we can estimate, for the population we interview, the probability of abortion. But we don't know for any individual in that population whether or not they had an abortion. In other words, the Randomized Response Technique allows us to gather information from the population without having any specific identifiable information from individuals about the incidence of an issue which we consider to be sensitive. We employ this technique, not only because we believe the question to be sensitive, but also because in many cases, if we were not protected by confidentiality laws, as of course most private concerns are not when they gather information, we might be subject to subpoena. But, since we do not have individual information, one couldn't subpoena anything that was individually identifiable.

For example, let's suppose in Mr. Barabba's previous incarnation as a private survey researcher, his outfit had gone out and collected information on illegal activity, say, drug abuse. And a person had responded, "Yes, I take drugs." Well, there would be

a chance that a law enforcement agent might be able to subpoena those records from a private organization. But as long as it's a randomized response, there's nothing there to subpoena. So, there are other reasons for the technique.

Student: We are involved in an attitude survey in my department and we ran into the problem of confidentiality. It's an employee attitude survey where we're asking them questions that might be a little sensitive, such as, "What do you think of the department? Rate it 1 to 9, very lousy to very good." The employee may naturally feel that he could hurt his career if he gives the wrong kind of answer. In order to solve the problem, we're using another agency to collect the data. We can be sure that we're getting data from every respondent, but we don't know which respondent is answering which questions. It's a double coding system.

Dr. Perrin: Techniques like that are important in data collection. Many people who have never been involved in data collection think that you can simply pass regulations and require reporting. You can get answers if you require reporting, but the truthfulness of the answers is often open to very serious question.

There are other data-collection mechanisms. I guess I never really answered that question completely. We have a hospital utilization survey where we take a random sample of hospital discharges to find out what people were hospitalized for, how long they stayed in the hospital, and things like that. We also have a national ambulatory medical care survey, a very exciting concept. For the first time we have a random sample of physicians practicing in the communities of the country where we go into their offices and record information on their practices. Do you realize that there's no regular data-collection mechanism in this country for the practice of medicine in physicians' offices?

Student: Are you running into any resistance in the physician survey? Does the AMA perceive it as an attempt by the Government to establish baseline data for regulatory purposes?

Dr. Perrin: Believe me, if we did not have the support of the AMA, we would not be in the field. It took us 2 years to develop that support and we did it very carefully.

Student: What is the magnitude of confidentiality between the practitioner and yourselves?

Dr. Perrin: We have the information on who he is and what he does. Again, because of our law it is absolutely confidential and is released to no one.

Student: Does the AMA either audit or review rights to the information before you publish it?

Dr. Perrin: For this particular survey the answer is no, although that is certainly not without precedent; we have had that discussion before on other issues. We're careful not to ask questions that we think are going to upset the physician. We don't ask him how much money he makes. We don't ask him what he charges for a particular visit because we feel the response rate would drop off dramatically. Again, it's voluntary; he can throw us out of his office, which some have. I get irate letters occasionally. But thus far it's gone very well though very slowly because of all these problems. What we hope to be able to identify and to characterize are the types of practice by the number of people seen each day, how long doctors spend with each patient, how many times certain drugs are prescribed, what the major complaint is. We don't even know what the distribution of patient complaints is for a physician's office. We're beginning to get that information; in fact, we're also coding what the patient says is wrong when he comes in. That's a terribly important thing. It's not just what the doctor thinks is wrong, but what the patient thinks is wrong with him that can be very important for matters of health education. So, this is very exciting information which is just now being processed and we hope will soon be available.

Student: When you obtain data from hospitals, do you use statistical data that they, themselves, develop?

Dr. Perrin: We use the information provided by the medical records group in the hospital, through the use of a standard reporting form.

Student: Apparently, you have a very wide range of respondents, from the administration of the facilities to the physicians, patients, and the nurses on duty.

Dr. Perrin: Absolutely. Each one has a special set of problems that have to be worked with very carefully. That's why it sometimes takes a couple of years to get these things going.

Student: In terms of public health statistics collection, is the United States ahead of the game or behind, in comparison to other industrialized countries?

Dr. Perrin: In some ways we're ahead. For instance, our National Health Survey is a model which the rest of the world is now copying. Canada is going to start one soon, Britain as well. But, we're behind in another sense. Our health industry is so disorganized that, in fact, the health data that are generated are here, there, and everywhere. Consider, for example, Britain's much more centralized health delivery system. Data flow naturally through that system and they really have a better record of the health care that's being delivered because it is paid for by one source. The British, in a sense, have a better grasp on the health of their people, or at least on the health care utilization of their people because of their system. Now, the system we have is private enterprise, really, and there's no way of pulling it all together. So, in some ways we're better off and in other ways we're not so well off. And the ways we're not so well off are because of the lack of organization of our health care delivery system, which is by design.

Student: Your aim is to make some sense out of both the public and the private sector.

Dr. Perrin: That's our aim. It's a never-ending task and victories are very small in this area.

Student: Is your aim really that or just to compile the data and analyze what the situation is so the decisionmakers can attempt some policy decisions.

Dr. Perrin: The difference between what you two said was that the second speaker asked if we're just collecting the data and making them available, whereas the first question implied that we

are making policy judgments on the basis of those data and thence recommendations? I want to make the distinction clear. The answer is that we do the former. We do not become involved in setting policy as a result of the information we gather. We gather the information and make it available to the decision-makers and the users. We haven't even fully accomplished that yet. That's really why we're here, not to talk about how to collect data, but how to use data. That's really the fundamental question. If we are collecting data but not using them, we might as well all quit right now.

Student: Who decides which data to collect, the user or you?

Dr. Perrin: Ultimately the Congress does. But the agency itself sets priorities on what it wants to collect, which I approve. Then I take these priorities to the Assistant Secretary for Health, to the Secretary for HEW, to the Office of Management and Budget, and, ultimately, to the Congress. The whole process is controlled through the resource allocation mechanism.

Student: Do they decide what they want to look at by surveying medical people?

Dr. Perrin: We have a very large panel of advisors, some 400 people, who we contact several times a year for new ideas. Then we have something called the U.S. National Committee on Vital Health Statistics which is a 15-member committee advising us on data collection. And we now have something called the Cooperative Health Statistics System which we hope will bring us in closer touch with the cities, counties, and States—the local users.

It is an important and fundamental point that, as a statistical agency, we should not become involved in setting policy for distribution of health resources and so forth, and that our task should be that of providing needed data for those who make the decisions.

Student: Although you don't set policy, the reason for your existence, is to collect information which will then be used to make policy. To take that one step further, probably the supreme policy goal in this sense is to better organize our health system, which is a combination of government and private agencies.

Dr. Perrin: Absolutely. It is extremely difficult to draw the line between what's data collection and policy setting. Obviously, one can present data in such a way as to influence the course of events. So, it's not all that easy to remain unbiased.

Student: Your system has, I think, a clear mission. Do you have a performance measure for it?

Dr. Perrin: The other question is, how well are we doing our job? This is extremely difficult to assess. If you are asking for a performance measure for the health care system in general, you need indicators. It's extremely difficult to know how well you're doing a job in an organization like mine. You can convince yourself you're doing a marvelous job if you talk to the right people. I think we've seen evidence of that certainly in the last 2 months. But whether we are or not, I just don't know.

Student: Isn't it because there is no policymaking that it's very difficult to evaluate?

Dr. Perrin: There certainly is a lack of something called a health strategy in this country at the Federal level. Of that there's no question.

At this point, we really haven't even gotten down to the new thrust in the National Center for Health Statistics which has occupied a lot of our time the last year or two. The tradition had been that the National Center for Health Statistics produced data primarily for use at the national level on events at the national level. In other words, we were not able to generalize or actually disaggregate our data down to the State and local levels very effectively, and almost all the publications we put out provided data at the national level. It was clear to many people that the real need for information, in terms of magnitude, was and still is at the State and local level. The greatest need is not really at the Federal level, despite the fact that we need information and many important decisions are being made there. In terms of everyday decisions, they are made at the working level in the county of Los Angeles, in the city of Tacoma, and so forth, and we were not really effectively reaching the users at the State and local levels. To meet this need the Center developed a program called the Cooperative Health Statistics System. It was previously called the Federal, State, Local Data System, which was shortened to FSL, and subsequently to Fissle. We changed it because we felt that the name stressed overly that we were dealing solely with governments, while we wanted to deal with more than simply governments. We want to deal with private organizations, or whoever the data users may be.

We are attempting to develop a union of data producers, at the local level, through State and regional to the Federal level, and a feedback to the users at all levels. The Cooperative Health Statistics System is our major new effort; an outreach program to the users which I'll let Doug Williams talk about. Doug is the Director of our Data Users Laboratory which is a very important part of our plans for the future of the Cooperative System. Let us now turn from the national scene to cooperation with State, local governments, and other agencies.

Mr. Williams: One of you asked who determines what to collect, and I think Dr. Perrin's answer was that the procedure is within the bureaucracy for getting something out to the public. But, as he said, our interests in the past have been in national statistics, and what we were confronted with was the fact that other people (like the State and local areas) needed good statistical information for managing and planning their health programs.

The Cooperative Health Statistics System was an outgrowth of the demand from the general public for some assistance in trying to develop intelligence information for health planning, management, and evaluation. It is a coordinated effort whereby we energize, help, or in a technical way assist in devising a system for the collection of data based on who can collect it most easily and has the most immediate use for the data.

As you can imagine, when you're dealing with national statistics, even in some of our inventory systems like health facilities, by the time you publish reports on that data, some time has passed. The data for national purposes are quite all right because our priorities don't change as rapidly as they do in a county or in a city. But for the city to sit back and wait for those national statistics to apply them locally is foolish. Their problem may well have changed by that time.

Local areas have had no particular statistical intelligence to apply to making their decisions. So, we're trying to develop a system whereby we enter into an agreement with State and local

areas to produce statistics, not only just to produce them, but to use them for their own purposes because of the rapidity of change at the local, State, and even the Federal levels.

Dr. Perrin has described our activities, and they've been primarily on a sampling basis. Except for such things as health manpower and facility inventories, our data just do not stretch down to State levels, not to even mention local levels. In each year's Health Interview Survey we have a sample of 200,000 individuals. That sounds like a lot of people and it is a very costly operation, but it just doesn't get at statistics that are usable to, say, local planners except from a comparative point of view. If you had similar statistics in the local area, you could compare and see how you stack up against the national average.

Our objective is to develop baseline statistics. We're trying to get general information on the population as a whole not just information through programmatic efforts like maternity and child health. These are good statistics, but they only reflect those people who appear at the medical door for services. You don't really know what the group looks like that didn't show up.

The major aims of the Cooperative Health Statistics System are to improve timeliness of data, and to allow comparability of data from all sources. Quite often an individual or establishment has its own private baseline statistics system and it may not overlap very much with other systems. So, any time you try to compare program-to-program, State-to-State, or locality-to-locality, you have a big mess where you just can't relate those statistics to each other.

Our goal was to reduce costs in the overall system of collecting and processing data. For instance, in our vital statistics system, which has been a Federal, State, and local cooperative effort for 75 years, at each level they would reduce the data and process it for their own needs and at the same time send in via the State to the Federal people microfilmed copies of the birth or death certificates themselves. Whereupon, we would code and process them for our own purposes. As you can see, this is a major factor in the cost of a system because we have redundant data reproduction all the way up the line. What we're trying to do, and I'm using this as an example because it's a very good one, is to reduce the data reproduction cost by having it processed once and only once, and then funnel it up through various channels for a variety of uses. That's just one element of the Cooperative Health Statistics System. But, as I said, it's a good example.

Therefore, we're talking about timeliness, comparability and reduction in cost, and there are other factors that we can get into with the development of such a cooperative effort. We do have a legislative mandate for such a cooperative effort.[1] This is part of the Public Health Service Act. It's a subsection authorizing us to enter into a cooperative statistics system with States and local governments or private industry. It does give us some mandate for sharing in the cost of developing such a system.

At the present time, the Cooperative Health Statistics System is comprised of seven components—vital statistics, manpower, health facility, hospital care, household interview, ambulatory care, and long-term care statistics. The first one we've talked about is vital statistics. The second is manpower statistics. Throughout the country there are various agencies involved in licensing health manpower, and we hope to tap into such a programmatic effort and develop national statistics about where and how many physicians, orthopedists, veterinarians, pharmacists, and so forth, there are. There are 13 occupations that are licensed in every State. We selected those as our manpower objectives for the time being. Manpower statistics also provide us a frame for getting at attributes of the practitioner and also a sampling frame for further callback surveys.

Again, in all of these systems we have to coordinate with the State as to their confidentiality laws, make sure that our interests as far as confidentiality are protected, and, in fact, monitor what exactly is being asked for, just as the Census Bureau does with us.

In the health facilities area we have also an inventory of facilities based primarily upon licensing. We have selected certain types of facilities like hospitals, nursing homes, and so forth, to be included in our Health Facilities Inventory. At the present time our focus really is on the three I have mentioned and a fourth. The fourth area is a little harder, but we've worked that out to some degree, and we're working on getting hospital care statistics at the present time. Incidentally, we're very much involved with the various other agencies in the Government who have some interest in the collection of hospital care data.

Student: How do you define hospital care? Is it things like in-patient/out-patient ratios?

Mr. Williams: In this case hospital care is the attribute of the in-house population, certain diagnoses, and so forth. As Dr. Perrin mentioned earlier, these records come from the medical record librarian, and they list attributes of the patients. Also, staffing of the hospitals and various other characteristics of the institution are shown.

Dr. Perrin: But those are only in-patients. We have difficulty getting our hands on information concerning out-patient care. It's a much less organized concept than the hospital situation and in-patient care. What we're talking about in this case is in-patient care.

Student: Is the agency in close contact with the AMA in terms of hospital accreditation and what they need to keep on their records, and are they in contact with you in terms of what the hospital provides as to specific statistics?

Mr. Williams: We are in contact more appropriately with the American Hospital Association and organizations such as this. We have developed data sets based upon recommendations by a panel of experts, who are from, among others, the Social Security Administration, private industry, and private abstracting firms. Also, Professional Standards Review Organization (PSRO) has recently come on the scene, and that's a very big influence on hospital care statistics these days.

Dr. Perrin: You should understand that these organizations often collect data for us. In fact, we contract with the American Hospital Association to collect information on hospitals. They're very willing to cooperate because it gives them public information, plus it's a way of cutting down on multiple reporting. In other words, if they deal with one Federal agency, they can get all of this report into the Federal system at once. The idea is that you won't have four or five different Federal agencies coming at you for data. The cooperation has been very good with the Hospital Association, the Medical Association, the Nursing Association, and others.

[1] Public Health Service Act, as amended by Public Law 91-515, sec. 210.

Mr. Williams: And that is primarily one of the complaints from the hospital administrators. They feel that they're inundated with all sorts of reports to fill out. Some think they have to devote a full-time staff to filling out certain reports. Of course, their approach is from a point of view of monitoring the system for their own programmatic purposes. Our concern is getting at statistical information about the attributes of either the facility or the patient, so other programs that have to deal with the availability of services can have some information about what is the current census of patients in the country and how many discharges there are a year, and things like that, to make certain program decisions.

In the case of household interview statistics, we've been conducting this survey for quite some time. It's very complex and has worked out to be quite a science in collecting good information via the interview technique. It's one of our hardest ones to put into this cooperative mode, because, depending upon how you ask a question and who asks it and so forth, you get a variance in terms of response. Therefore, we're having a great deal of what you may call shakedown cruises in various States to determine how well this can be done via a cooperative effort. We are doing the same thing in the other areas where we need reliable, timely statistics. They're in an experimental state right now. Ambulatory care statistics, our own national survey, today represents only about 1,500 physicians, and we have to go to great lengths to get something like an 80-percent response rate. You can imagine that we really want to be up on our toes when we launch anything like this in a cooperative mode.

The same thing is true for long-term care statistics. There's a real hard nut to crack! How do you get information on long-term care facilities? In the first place, how do you define them? Then, how do you collect information on them? Anyway, these are the components that now constitute the Cooperative Health Statistics System.

A question was asked earlier about how we determine what data to collect. Let's take the development of the health manpower minimum basic data set. We convened a panel of experts, to come up with initial recommendations as far as health manpower was concerned. Whereupon we took the product that they gave us and circulated that among two or three thousand individuals at the State and local levels, universities, and the Federal Government. From the responses, which were something quite short of 2,000, we took the substantive ones. We synthesized what they had to say, and came up with what we call our minimum basic data set. It's always going to be under review, but what we're trying to do is to get the State, the local, and the Federal requirements, and intersect their interests to determine the minimum data set that all of us have some need for. A State can tack on its requirements, and I don't think the Federal Government's ever going to need more than, say, the core data set. This is what we're now trying to install throughout the country.

Student: What is the size of the current core data set?

Mr. Williams: We've got various components and there is a minimum data set for each component. There are some 30 questions on the health manpower minimum data set. There are some 20 or so on the health facilities data set. They mostly deal with the attributes of the individual or hospital.

Dr. Perrin: Our concept is that if you collect a small amount of data well, apply uniform criteria, you're going to be much better off, and it's going to cost you less in the long run than if you just accumulate data willy nilly from various places. That's what we're trying to get at, to accumulate a defined set which has applicability at various levels.

Mr. Williams: Our scheme is one of trying to share needs, techniques, and information about health data. We have an exchange of information with the States and local areas, we support each other in our aims, offer technical assistance, and that assistance doesn't just go one way. We have certain research efforts in the States that we benefit from. Understand that our system is not so much confined to the data itself, but to developing a system for retrieving information.

One of the primary vehicles for improving services is through government agencies. As a matter of fact, it turns out that some of our prime confederates in this undertaking are government agencies working at State and local levels. Understand that we're restricted when we talk about funding. We've got some 3,000 counties in this country and when we start dealing directly with the county, then we're fragmenting ourselves. Therefore, what we have to do at the present time is to deal primarily at the State level now and encourage the State to deal at the local level.

Student: What if the State either has no interest or no resources for dealing with the particular level of statistical activity that both the local area and the Federal Government are interested in?

Mr. Williams: Then we have to base our approach on the population we're attempting to cover. If a State has no interest, we would probably try to generate some, and not go beyond the State to a county level except in the area of research and development. The county is a very good area for certain development activities and serves as a very good lobbyist with the State to generate some activity in the areas where we have a common interest. Right now, what we say and what we're able to do is governed by the amount of funds and capabilities that we have.

Student: I can see you eventually being inundated with requests for information at the local level.

Mr. Williams: Requests for information are what we're trying to preclude here. We're trying to have that data generated by those local people who have a need for it and then they're not going to be requesting from the Center of Health Statistics data pertinent to their local interest, except from the point of view that they may want some comparative information to see how the rest of the country stacks up. Instead of going to each county and each State and getting that independently, we'll have it at a central location for them and we'll process it.

These data, when processed one time, say at the local level, and then sold or given to other areas, become much more immediate. If we put it in machine-readable form at the county level and then share that with the State, and then the State shares that with the Federal Government, we've got a much more timely system.

Dr. Perrin: You may be interested to know that we receive, in my office, approximately 2,000 requests a month for information from private citizens. That runs about 25,000 requests a year, many of which are not tabulated because they go directly to certain divisions. So there's a large demand, and this is just the tip of the iceberg.

Mr. Williams: Furthermore, the requests are for more than just information. We have a tremendous demand for technical assistance at the Center for Health Statistics. From the technical assistance point of view, we are limited in how we can operate at the present time. With budget increases and so forth, perhaps, we can expand these activities and deal more closely at the local level, beyond just research and development or planning and development activities. In a cooperative health statistics system we're not just talking about developing minimum data sets and then fishing these out. We're talking about developing an exchange system of cost and technical know-how. What this says is that we're trying to establish health sharing systems such that we can underwrite some of the costs of producing data for Federal interests, while at the same time the States underwrite the costs for their interests. We exchange the data; we have standards, definitions and procedures that we all try to adhere to for comparability.

Student: How well is the data methodology that you have within a particular field of health care integrated with the broad aspects of Census Bureau programs?

Dr. Perrin: Once we promulgate a certain data set for our data systems, we refer it to the department level, and there it goes to a standards group which considers it for adoption as HEW practice. Ultimately, however, the Secretary of our Department has the responsibility for setting standards in data collection. At each point a decision is made as to how wide the requirements should be.

Student: Do you have good cooperation from the local and State agencies?

Dr. Perrin: We have good cooperation as long as we have a carrot, or a stick, depending on the situation. If we provide funding, most State agencies are quite agreeable to go along with the standards and, of course, we do attempt to promise cutting down Federal requirements in data. One of the biggest things that we can do is to say, "Look, if we agree on how to do it once and for all, and do it right, you won't have all these programs coming at you for different reporting requirements." They're very receptive to that.

Student: Are there any States with poor health care that do not wish to cooperate with you?

Dr. Perrin: I don't know of any instances in which that's the case. However, in most States where health care is somewhat below the national average, the ability to gather data on it is also below the national average. The two problems seem to be highly correlated. We generally lack information on areas where health care is the poorest.

Mr. Williams: In that particular area, statistics for damning purposes isn't our game. I don't think the State would be reluctant to provide us with the information for our purposes which are really finding the general characteristics of the population. However, it doesn't prevent some data user from taking our findings and making a case for or against a State. Our system doesn't directly have that intent. However, a lot of people think that anything that goes to the Federal Government is all coordinated with the Census and IRS and with this, that, and the other thing. So, we do run up against that sort of attitude occasionally. We don't have any experience directly where people want to protect themselves so they don't furnish data.

Student: Perhaps it's that you haven't discovered it yet.

Mr. Williams: That very well may be. Someone asked earlier what participation we have with the States. More, really, than we can handle right now because of our budget. We've had a tremendous response from the one Request for Proposals that we've put out on implementing these four data systems: vital statistics, manpower, facilities, and hospital care.

Student: Your last point was cost sharing with the States. I can see a lot of repercussions there. You can say that if they help out, the Federal Government can have a real fine health data system. But suppose they feel they are paying for something they don't need.

Mr. Williams: What we're trying to do is, in a sense, purchase information from the States. We want to underwrite our fair share of the production of this data.

Student: Is this prorated?

Mr. Williams: Now it's really flying by the seat of our pants because we don't have any experience as to what some of these data systems cost. What we're doing is soliciting contracts through a competitive contract mechanism. In the future, we hope that through one of our advisory committees to the Cooperative Health Statistics System we can come up with a funding formula.

Here are some of the activities of the division of the Cooperative Health Statistics System. We have research and development activities that have been ongoing for 3 years and we plan to increase them in the future. We develop the core data sets and try to promote them and get interested parties to collect them, and to suggest changes. This will continue to go on for some period of time and probably we'll never really set it in concrete. But we hope there will be minimum change for temporal references and for analysis. We have a technical assistance program where we actually assist the States in implementing a system such as the one we've been talking about. We have training and personnel development ability and capability. We have the applied Statistics Training Institute, which gives short courses. In the Data Use Lab we hope to launch a longer term training session. We also invite, where space and personnel are available, interested parties to come into the center and nose around to find out what we're doing and to take advantage of some of our experience, and we're also doing that very same thing on the outside. We're going out into the States, looking at some of the activities in the States and trying to adapt what is better than our procedures, especially in the area of analysis and utilization of data.

We have a communications activity, the product of which

has been primarily newsletters. These generate quite a bit of response and interest in the Cooperative Health Statistics program. You might well imagine that we have generated quite an extensive mailing list over the past 13 years. On the list are vital statistic registrars, public health schools, epidemiologists, university vital statistics programs, health officers, associations, etc.

Dr. Perrin: But, I think we have to be honest and say that data dissemination is one of our greatest problems. Quite frequently, we don't know where to disseminate things. Often we have some very good material that doesn't get to the right people.

Student: Do you send your data and information regarding health facilities and hospital care to hospitals?

Mr. Williams: We have personnel traveling around the country talking to various interest groups. We request them to write to us and specify where their interest may be by generic category. Then we come up with a mailing list for certain types of information. We produce monographs that are analyses in a comparative sense of the various types of data we produce. Through our own efforts, others, such as comprehensive health planning agencies, receive our literature. If we develop something that we recognize they have a need for, then we'll send that out to the Federal comprehensive health planning group who will, then, in turn, notify all of their people. All vital statistics registrars in the country get copies of our vital statistics volumes. We also send them to libraries—certain libraries like those in schools of public health, and programs where we can identify an interest in some of the data we produce. But, by and large, distribution is on a request basis.

The last thing I want to talk about is the Data Use Laboratory and the use of the data itself. Those people interested in health data are generally handicapped by the fact that there are usually no analytical types on their staff. What we're trying to do in the Data Use Lab is to develop a procedure and some examples of how to use data for certain settings. Understand that we have to protect ourselves from being identified with any programmatic interests, but we can concentrate on methodology. We can concentrate on the packaging of information. So, in the Data Use Lab that's our focus, to try to identify innovative methods for using data.

We're also trying to develop packaging techniques so that we can make data more understandable to various types of people who have to make the decisions, for instance, legislators. You go at them with a giant ream of computer printouts, and you know where it's going to go, and you know what kind of names you're going to be called for having brought it in. But if you produce for legislatures maps, various types of graphs, and some summary analytic statistics, you do have a channel of communication. For instance, if you talk about the odds of a person getting a specific disease, you're talking a language that people can understand.

Therefore, what we're trying to do in the Data Use Lab is come up with a few procedures whereby you can go directly from raw data to understandable formats such as computer mapping. Of course, we're talking about expensive equipment, so a small county in Mississippi or somewhere like that still might do it by hand. But they can apply the procedure to make the data more understandable.

Student: How current is your information? I know that after a holiday weekend the Highway Patrol tells us how many traffic deaths there were for that weekend. How current is the information that you can provide?

Mr. Williams: That's one of our big problems right now. Our data is not that current. For example, "vital statistics" is a couple of years after the fact. That's one of our big problems and that's one of the things we're trying to answer with this Cooperative Health Statistics Program. We don't have weekly reporting except in vital statistics, where we also have preliminary reports monthly by State.

Take the Health Examination Survey; it comes out several years after the cycle of examinations because of the number of individuals examined, and we have to go through certain probability cycles before we can produce any statistical information representative of a larger population. It takes us a full year to get through a probability cycle, after which our analysts can take over and start producing monographs. In something like the Health Examination Survey, or the Health Interview Survey, you're talking about complete data a couple of years after the fact. That's what we're trying to overcome with our local emphasis program—to develop the data at the level where it's most needed and have it immediately available for us.

I have a couple of illustrative examples of the types of things that we're doing now that are of interest to local areas and can be applied there. One is what we call our Standardized Microdata Tape Transcripts. This is elementary information with all descriptive and identifying information removed, of course. For instance, we often package a piece of information that may have all sorts of data in it unnecessary for the user's immediate needs, and in that case one might want basic data entries that answer a specific interest.

The Census Bureau does a beautiful job of packaging its information in microdata form. We've only begun to do that, and really haven't developed the capability that we will have in the future. Also, because of our data being limited primarily to national interest and national programs, and because of the clamor from States and localities for the type of information we produce, we've come up with a fudge factor system for developing information that can, in some way, give you a first-line intelligence on what may be happening in your State. We do this by taking the national rates and applying these to the demographic structure of a State. We call it synthetic estimates because this is a manipulation of our real estimates that have known reliability. The synthetic estimates have no known reliability; they're simply a quick look at what may be happening.

Dr. Perrin: Let's spend a minute or two on the topic of social indicators. We haven't really said anything about health indicators. The reason is we're still learning about them. I invite you to think of the concept of health indicators and how useful they would be if we were able to generate some meaningful ones. It may appear on the surface to be rather easy for us as purveyors of health data to provide health indicators.

Can you think of some things that would be useful as health indicators that might be useful data to collect? Classically, there have been certain ones. Do you know what the traditional health indicator has been for years? Have you ever heard of the infant mortality rate? That's a health indicator of sorts. It's a measurement of the proportion of the infants that die within the first few weeks of life. For many years people have felt that if

this rate is high, health care is bad. If it goes down, health care gets better, and so forth. What do you think about this as a health indicator?

You have to ask yourself, what is it that you want to indicate? What do you want your indicator to do? I'm often asked for a measure which will make it possible to determine the effectiveness of health care delivery systems. That's a large problem. If we had an indicator which we could follow over time which would fluctuate as a result of programmatic changes, we might possibly be able to answer many policy questions. Can you think of any other possible indicators of health? "Causes of death," you say. These do change over time. We've seen a dramatic change from the acute infectious diseases in the last 30 years down to the more chronic diseases today. In fact, in the last couple or 3 months, we have shown that deaths due to heart disease have decreased over the last 5 or 6 years.

Student: Since coronary care units?

Dr. Perrin: Since coronary care units. You are making the lightning jump from the fact that death due to heart disease is going down to the fact that it is probably due to our having coronary care units. I'm not willing to go that far with you. That's an indicator. It's certainly one of the ones you'd have to look at. We simply produce the data, we don't interpret it.

Frankly, we are not that well equipped with health indicators in this country. By the time you have talked about infant mortality and average length of stay in the hospital, you've just about exhausted them. And, maybe these indicators are not sensitive enough.

Student: What about group medical practices? Is that going to help you at all in getting more data?

Dr. Perrin: The question is not getting the data; the question is defining and conceptualizing the indicators, the variables, putting the variables together into a meaningful set of indicators or a meaningful index.

Student: You made the statement that perhaps the indicators are not sensitive enough. In the development of indicators, isn't there a danger that whoever defines those indicators might come up with some that say that the U.S. ranks number one?

Dr. Perrin: Right, they have to be careful about that. Many of our indicators lack sensitivity, that is, they don't fluctuate as appropriately, or lack specificity in that they fluctuate as a result of things that appear to be quite independent of health care.

Student: Do indicators come out of the PSRO's because the physicians are supposed to determine the quality of care?

Dr. Perrin: PSRO's will be asking the question, is the quality of care sufficient in this area? They will have to define what they mean by "quality of care" and they'll have to measure that. Research into the quality of care will yield indicators on quality of care, I'm certain. I don't know what those indicators will be. Length of stay in hospital is one of them, of course. Because if you have an area in which a person goes into the hospital and stays much too long as a result of that condition, they tend to ascribe that to poor medical care.

Student: How far advanced is the idea of a medical audit?

Dr. Perrin: Quite far. I think it is generally accepted by hospitals.

Student: Most of that is being done on the professional side. Now, what's being done for the consumer? How are they having access to, say, medical audit records, or the PSRO files?

Dr. Perrin: They do not have access to them because they are considered part of our or the physician's confidential files. A hospital is considered a committee of physicians. I think if you look at it on the other side you would have law suits like you can't believe. Everyone could come in and say that a given level was the standard and it had been missed by so much, and maybe it meant 2 more days of hospitalization and everybody reacts differently to treatment. Your hospitalization would become incredibly expensive because of malpractice suits.

As soon as you start to apply standards for quality of care, you force people to do things that they often would not do and the cost of medical care goes up dramatically. For example, the reason so many of us have to have so many lab tests is not because, in fact, they're really necessary, but because of the profession's feeling that if they don't do these, one may be attacked with a malpractice suit. A lot of the price that we pay for medical care is a result of the physician making certain that he meets all of the possible kinds of standards that might exist. You have costs pushing in one direction and quality pushing in the other, and the two seem to be in conflict.

MEASURING NATIONAL WEALTH AND WELL-BEING

Sidney L. Jones, Deputy Assistant to the President

"I wholeheartedly agree that such measures of human welfare as our health, our legal system, our environment and our resources are essential, and they are of fundamental importance in almost every significant governmental decision. When government officials attempt to make a policy decision they frequently discover that the basic information is not available. A more comprehensive set of statistics covering various social questions is definitely needed."

Sidney Jones

Mr. Barabba: This afternoon we're going to hear from Dr. Sidney L. Jones, who is currently serving as the Deputy to the Counselor to the President for Economic Policy. Prior to this position, he served as the Assistant Secretary for Economic Affairs with the Department of Commerce. In that position he was my immediate superior, working with the Bureau of Economic Analysis and the Bureau of the Census. Before that, he served in other Government posts, including Senior Economist and Special Assistant to the Chairman of the Council of Economic Advisers and Minister-Counselor for Economic Affairs for NATO. Prior to that he was a professor at the University of Michigan and Northwestern University. He is a most distinguished economist and, in addition to that, he's a pretty nice guy to work for. He's not as nice as he looks. Sometimes, he gets quite tough. So don't let his pleasant demeanor fool you.

Dr. Jones: I think it would be like the emperor with no clothes if I did not comment on today's events before discussing some of my views on the role of economic statistics. I will then talk about the Gross National Product accounts, and what relationship they might have with the subject of social indicators.

This is my fifth year in Government service, beginning in 1969 with the Council of Economic Advisers. Obviously, the past month has been one of the most difficult phases of that tenure. Nevertheless, I think it has been a great credit to our Nation, to our institutions, and to our Government that over the last 2 years, and particularly the past several months, so much good work has been accomplished under the most difficult of circumstances. Even as the drum beat of events has accelerated over the last month, I have been impressed that the functions of Government have proceeded reasonably well. Some of my activities have not proceeded as well as they might have, but in the main, I would say that the Government has done well and that its achievement is a credit to all the people involved. The important thing is that we have discovered that our institutions really do work.

In summarizing my views on economic statistics, I will rely on personal experiences that extend back to 1969 when I was at the Council of Economic Advisers. Over the past year, it has been my privilege to work with what are probably the two most professional organizations in our Government: the Bureau of the Census and the Bureau of Economic Analysis.

The Bureau of the Census is a major collector of information and the Bureau of Economic Analysis has major analytical responsibilities. I believe we have had a happy marriage. The Bureau of Economic Analysis is a much smaller organization (about 800 employees) as opposed to the larger unit, the Bureau of the Census, which employs about 7,000 people. About half of the Census employees are enumerators. But, the two bureaus do work well together. The Bureau of the Census collects the economic and social information, which then is used by the Bureau of Economic Analysis, along with inputs from many other agencies, to develop the National Economic Accounts.

Economists have been involved in efforts to develop National Economic Accounts for at least several hundred years. In the 1700's the British Government developed a set of accounts to measure the results of the industrial revolution. In the 1920's the U.S. Government included a group of economists who analyzed rail car loadings and pig iron output to determine what was going on in the economy. That group was the predecessor of the Bureau of Economic Analysis.

The Great Depression of the 1930's highlighted the need for a more sophisticated system of economic intelligence. Fortunately, it was about that time that the intellectual inputs were forthcoming from various sources. The 1940's accelerated the trend toward an integrated set of economic statistics because a major part of the wartime mobilization effort involved the allocation of resources, and that is what economics is all about. By the end of World War II, we had what we now would recognize as the National Economic Accounts; both the Gross National Product, which is largely the product side of it, and the National Income Accounts, which are the results of those activities. Since then a series of modifications have been made to improve the accounts to their present level of refinement. We clearly recognize that additional improvement is required and the Bureau of Economic Analysis is more aware of that need than any other group.

There are several points that have to be emphasized. First, the accounts are used to measure production or output. Second, they are focused on the output of goods and services which can be measured in financial terms. Third, inputs, the costs of those elements that result in a finished good or service, are measured according to whether or not they take place in the market system. These three points are quite important for understanding what we are trying to do, as opposed to what various social measuring techniques might attempt to achieve. Because the accounts are output-oriented, they summarize the final values of goods and services, not their intermediate values. To make it even more complicated, the measures must fit into finite time periods of either 3 months or a year.

The basic concept of the accounts is rather simple. One adds up the financial value of what is consumed by individuals,

outlays by the Government and the business sector for investment and procurement and the net effect of our international transactions. The summary total of these major sectors becomes the Gross National Product. Underlying that total, however, is a complicated set of assumptions and many very complex definitions. In most cases, the values used involve specific transaction prices reported in the market place. However, there are some situations in which estimated values must be used. For example, we estimate the value that a homeowner would have to pay to rent a residence and the value of the food that a farmer may produce for personal consumption at home. We estimate the value of commercial bank transactions because there are many services in the commercial banking industry which, because the interest rate carries the burden, are not directly charged. Basically, the Gross National Product attempts to record the transaction value of our Nation's economic activities.

For many years these accounts have provided a useful record of national economic events. Even more important, the National Economic Accounts are of crucial value in analyzing current economic change. The creation of national policy is dependent upon such analysis. In the private sector, individual companies and consumers need to understand what is happening in the economy. Decisions at all levels depend upon this set of detailed statistics.

Gross National Well-Being

Beyond economic measures, there are many other values that can be generally referred to as welfare goals. There is certainly more to life than the output of goods and services as measured in the GNP accounts. Obviously, it is extremely important and interesting to know as much as possible about the welfare status of any society. Therefore, many analysts have advocated the development of additional statistics to measure the "gross national welfare." Part of this interest results from a basic concern that the existing GNP accounts, as we know them, may not be the best way to measure welfare values. The existing GNP accounts clearly do not include a number of things which are very relevant to the quality of life or the welfare of our society. I would agree wholeheartedly such measures of human welfare as our health, our legal system, our environment, and our resources are essential, and they are of fundamental importance in almost every significant governmental decision. When government officials attempt to make a policy decision, they frequently discover that basic information is not available A more comprehensive set of statistics covering various social questions is definitely needed.

My basic point is that we have a variety of valuable statistical measures. Some are combined to report the gross national output of goods and services. Others are used separately to evaluate the status of specific welfare needs. Each set of statistics is important and useful. But having said that, I think it would be very unfortunate to confuse these two issues. That is, we have a measure of output of goods and services, stated in financial terms and tied to market transactions, which claims to be nothing more than that. The economic significance of such statistics should not be confused or compromised by trying to convert the Gross National Product into more than it really is. The GNP is not a measure of our national welfare. The fact that the GNP may rise from $1.288 trillion in 1973 to $1.4 trillion in 1974 tells us nothing about the welfare needs of the country the various causes of human despair and happiness, the unfortunate animosity between races, the quality of our homes and families, general health conditions, or many other welfare issues. The GNP figures do give us a hint as to what employment levels are likely to be, and the availability of work opportunities obviously does influence every other social issue. Yet, to attempt to make the GNP accounts into a more comprehensive measure of social welfare than they are would probably detract from the existing important advantages provided by these GNP statistics.

Critics of the current framework of GNP accounts argue that they are much too narrow because they fail to measure the current benefits resulting from previous capital investments in buildings, machines, education, health, etc. Although all of these investments provide a source of future benefits they are not reported in any current Gross National Product because only the current output of goods and services is included. In other words, if you erect a building in 1973 the initial outlays involved are reported only in the GNP for 1973, even though the building provides shelter or office facilities for many subsequent years. The GNP will not reflect the ongoing output of a structure over the coming years.

Another major criticism of the GNP accounts concerns the procedures used for reporting on economic activities involving the Nation's environment. The Bureau of the Census has a major project underway to identify the environmental injuries associated with economic activities. Next year it hopes to collect information on the capital investments for pollution abatement so that some cost/benefit comparisons can be prepared. The Bureau of Economic Analysis has a team of researchers working on the complex definitional problems involved so the purchases of equipment and payrolls committed to pollution abatement can be identified. But it is difficult to classify activities which avoid pollution. For example, assume that a very simple economy commits all of its material and human resources to the production of 1,000 loaves of bread. If that simple society subsequently decides that the existing production processes have to be adjusted to avoid pollution, then the number of loaves produced might decline to 950 loaves. In this simplistic example, the total GNP would be reduced even though society continued to achieve its identified goals.

This abstract example can be further complicated by considering two additional factors. First, if the economy had additional human and material resources available beyond those used for satisfying the existing demand for bread, it might be possible to continue to produce the 1,000 loaves of bread and achieve pollution abatement goals as well. A second situation might develop where the society decided to use some of the resources previously used to produce bread for pollution abatement and correction efforts. Under this set of assumptions the output would consist of 950 loaves of bread and the "services" created by the other activities.

These examples are exceedingly simplistic and fail to dramatize the difficult definitional problems involved. The decisions about pollution abatement are not dependent upon GNP measurement considerations but these problems do offset our economic accounts. If resources are available to work on pollution abatement, without reducing the existing output of goods and services, then the services provided have to be properly defined and measured for inclusion in the economic accounts. The capital investment in equipment can already be measured

under existing GNP definitions. There is a value to the current analytical effort because it indicates that resources are diverted when pollution abatement efforts begin. If resources are already fully utilized, then current output declines and the offsetting "services" have to be identified.

The basic message of economics is that resources are limited and must be carefully allocated to a long list of competing demands.

Measurement Difficulties

Student: Wouldn't the Government simply identify the value of the pollution abatement services?

Dr. Jones: One of the great myths is that there is a central government agency that can identify and solve (including the financing) all of society's problems. There is a Congressional appropriations system which can allocate funds to pollution abatement programs, but the definitional and measurement problems of preparing the National Economic Accounts still remains. The value of cleaner air and water is a difficult concept to measure. A similar problem involves the measurement of the actual deterioration of the environment resulting from economic activity. The economic benefit of a pollution abatement effort is not the same thing as the input or cost value created by the activity.

Student: Are you saying that the benefits could actually be more than the cost of preventing the pollution?

Dr. Jones: My assumption is that the financial value of the benefits would be more than the abatement expenditures, but it is extremely difficult to impute a value to these benefits. The other economic activities involving consumption, investment, government outlays, and the net value of foreign exchanges of goods and services all have an explicit transaction price.

Student: Can't you impute certain types of values? For example, in the very simple analogy you just referred to, isn't there a sacrifice in the economic decision that is made? Isn't it a question of who's going to pay for the avoidance of pollution? You mentioned an obvious example involving consumers who decide they will accept fewer loaves of bread at a higher per unit cost if human and material resources are already fully employed, so that the diversion of such resources into preventing pollution reduces the output of other goods and services such as bread.

Dr. Jones: Yes, the value of pollution abatement could be crudely estimated using the methods suggested. But the problem becomes more complex as we turn to other alternatives such as public parks or cultural opportunities.

Student: Wouldn't it be possible to measure the capital expenditures required to enable operating enterprises to comply with whatever air pollution and water pollution regulations the Government decrees? It seems to me that these capital outlays and incremental operating costs could be identified as they are absorbed.

Dr. Jones: The Bureau of Economic Analysis has been working on this exact problem for some time and its report will be forthcoming soon. The Bureau of the Census has a current project that is trying to measure the value of capital investments for pollution abatement purposes. However, the problem remains of estimating the resulting benefits. In order to calculate a cost/benefit analysis both pieces of information are required.

An interesting example of the problems involved in this type of analysis was discussed in chapter four of the **1970 Economic Report of the President**, prepared by the Council of Economic Advisers. The issue involved air pollution standards and the effects of their enforcement upon the sulfur emissions of various polluters, particularly smelters in the Northwest. There are two different ways that these standards might be enforced. One approach is to have the Environmental Protection Agency establish an arbitrary standard requiring everybody to cut out 95 percent of their air polluting emissions. For most homeowners, utilities, and many companies that operating adjustment would be feasible without excessive costs. But, for smelters, there is no way that they can do it given existing technology and costs. An alternative approach to achieve the overall goal of a 95-percent reduction in total air emissions would be to permit varying levels of performance as long as the total correction is achieved. In the example presented by economists a pollution emission tax would create an economic incentive to reduce pollution. For example, a so-called "pollution tax" of 3 cents per pound on sulfur emissions might be imposed. For a large utility with high stacks and the technology to trap the emissions, it might be economically attractive to install pollution abatement equipment to avoid the 3 cents per pound tax. However, if the costs of preventing pollution for a specific company, such as a smelter, exceed the tax to be paid, the firm may decide to pay the penalty. Nevertheless, the overall goal of 95-percent improvement in the air can be achieved by having other utilities, manufacturers, and individuals eliminate 100 percent of their pollution. The tax revenues, of course, could be used for research and development to create the necessary technology for the smelter to reduce its pollution and for restoration of the environment.

There is a difference between the regulatory approach and the economic approach. Unfortunately, some critics are unwilling to consider the second because they mistakenly consider it a license to pollute. To the contrary, the economic approach merely allows a more flexible means of achieving the same overall goal.

Student: In your explanation you said that if a company can use antipollution equipment at a cost of less than the penalty tax it would have an incentive to do so. You defined the whole scheme on a pure economic cost basis. To me, that means that if you can afford it, you can pollute, and if you can't, you don't pollute.

Dr. Jones: No. What I'm saying is that if it has the proper economic incentives, operating through available technology or improved efficiency, to adjust at a cost less than the per pound tax, then it would pay the company to do it. If not, it would pay the individual firm to continue its existing program. But the key point is that the total pollution abatement goals would be achieved because those with the economic capabilities to reduce pollution would be specifically motivated to do so. The blunt fact is that technology is not yet available to permit every company to eliminate 95 percent of its unwanted emissions.

Student: Why have an option? If it's worth going after the 95-percent goal, why not make everyone comply rather than merely fining them?

Dr. Jones: You are assuming that some philosopher king can decide what the right adjustment price should be and that you really don't care that some smelters go out of business.

Student: We're talking about saving the environment.

Dr. Jones: No, we're not. We are talking about the total goals of society which include providing jobs, expanding capital investment, providing the goods and services that people want, assisting other nations, and many other things.

Student: Aren't we talking about some sacrifices being made?

Dr. Jones: Yes, but we should be talking about doing it intelligently. Remember that the pollution abatement goal is to eliminate 95 percent of the unwanted emissions. By having those individuals and companies that are capable of eliminating 100 percent of their pollution do so, the overall goal can be achieved without destroying those specific firms that cannot adjust. It should also be noted that the pollution tax revenues could be used to restore the environment.

Student: Who decides that the goal should be a 95-percent reduction?

Dr. Jones: This is an arbitrary rule promulgated by the Federal Government.

Student: If society can achieve a 95-percent reduction without asking the smelters to reduce pollution, it may be that the goal is too low.

Dr. Jones: Yes, that is true. My explanation was only intended to suggest two different methods of achieving the identified objective. The first approach is to issue a Federal regulation which says that everyone must reduce his air emissions by 95 percent. The alternative is to develop economic incentives to encourage a more efficient adjustment process.

Student: Do you favor the second approach primarily because it's more economically viable and efficient and because it allows you to calibrate the equilibrium point more precisely in a financial sense?

Dr. Jones: Exactly. The analyst may not know the proper emission tax to charge, but the economic approach permits adjustments to continue until the equilibrium point is determined. In this way economic and environmental concerns can both be recognized.

Another criticism of the existing GNP accounts involves the absence of some imputed value for service performed in the home. The financial value of domestic services are included in the National Economic Accounts if they are performed by a non-family member. But in the grotesque example that economists love to use, envision a situation where a man marries his housekeeper. In the current National Economic Accounts, the GNP at that point would decrease because the services of the housekeeper would be eliminated and we have no way to impute the value of the services now being performed by a wife.

Student: Why not impute a value to the services of housewives?

Dr. Jones: How would you do that?

Student: By assigning the market value of their services to the time spent on homemaking duties.

Dr. Jones: But what is the market value of their time?

Student: It would be $2.00 an hour, $3.00 an hour or whatever it is.

Dr. Jones: But whatever is it? What specific rate of compensation would you use?

Student: You could use the rate that is paid to people who are working at housekeeping duties and getting paid. You could use those standards.

Dr. Jones: Are you suggesting that the household worker is interchangeable with a housewife?

Student: Are there any benefits for being a wife?

Dr. Jones: My own view is that this is the most important calling in our society. But that is a value judgment. The problem for us to consider is whether or not the activities of a wife can be valued using the financial measures applied to payment of domestic help.

Student: Aren't they doing the same functions? They are performing many services.

Dr. Jones: My wife works much harder than I do. I don't deny that there is a fantastic service being performed. But, I'm not asking that question. I am asking: What services are performed, which of those services should be measured in financial terms, and what rate of imputed financial payment should be used? For example, should the imputed value of every wife be equal? Should the imputed value change over time? Should the imputed value differ according to age, other part-time functions, number of children, other activities outside of the home, etc.? In short, the determination of an imputed charge seems to be literally impossible. This does not mean that the services of wives are not of great value to society as well as to their families and husbands.

Student: But you do pay your wife something. You provide services of a protective sort—food, shelter, and all that. You have an income that accrues value to both of you unless you abstain from giving your services.

Dr. Jones: Are you suggesting that I should use as a proxy what a domestic worker earns?

Student: Why not?

Dr. Jones: Because a wife is something much different than a domestic worker.

Student: Now, are you just being facetious?

Dr. Jones: No. I'm saying that it sounds so easy to accept that simple substitution concept, but the problems referred to above

make it impossible to figure out how to do it. As a fall-back position I suppose we could impute a value for only those manual services associated with domestic service as distinguished from the diverse contributions of a woman in the role of a mother and wife. That would narrow the complexity of the valuation problem, but it is still impossible to identify the average "output" of a wife in functions limited by definition to domestic service.

Student: Hasn't it been defined, though, as $12,000 a year?

Dr. Jones: That figure was approximately the average total family income in 1973.

Student: But a wife is a general practitioner. She is not a specialist in terms of the type of labor performed.

Dr. Jones: I certainly agree, and that point further complicates the valuation process.

Student: In economic terms, what is so mind-boggling about estimating her total services if you change the situation to assume that your wife, or anybody's wife, were to perform the same household services of laundering, cooking, or house cleaning, in somebody else's home for a price?

Dr. Jones: That is such a paltry listing of what a wife does. What about counseling, caring for children, sustaining discouraged husbands, and helping neighbors; that is a short list.

Student: You're getting out of hand.

Dr. Jones: Exactly. The examples are suggested to indicate the complexity of the estimating problem. We too often assume that statistics can be easily created by simply extrapolating averages for large numbers of people.

Student: What about when a friend comes to you and asks for help? You don't charge a counseling fee. You don't want to measure all those things.

Dr. Jones: That is a correct point. We don't attempt to measure most of our social functions, do we? The same point applies to the household output.

Student: What we are saying is: If you measure domestic help, a woman who goes to another family's home and works from 9 in the morning till 4 or 5 in the afternoon, why don't you measure that for a regular housewife?

Dr. Jones: In the case of work outside of the home, a specific financial value can be determined because wages are paid and payroll taxes are collected by the Government.

Student: Let me ask exactly what we're measuring in the Gross National Product.

Dr. Jones: That is the subject we started out with. The National Economic Accounts are an estimate of the goods and services produced, measured in financial values, for transactions occurring within the market system.

Student: Is there a possibility that the Bureau of the Census could calculate what the average woman with a certain educational level earns in outside employment, and then use that figure to impute the output of housewives?

Dr. Jones: That could be a possible approach if it is decided that the accounts need to be changed, although this approach is so general that the assumptions are very questionable. Your comment also emphasizes one very serious problem that requires immediate attention. Wives are discriminated against in calculating social security benefits because the tremendous contributions of wives are not assigned a financial value. Under existing social security laws, if a wife is divorced and she has a history of earnings she will receive social security benefits when the various age and other eligibility requirements have been fulfilled. Following a divorce, each party simply retains the appropriate earnings record accumulated. Yet, if the divorced woman is a nonworking wife, what happens to her? She has no work record. She has no accumulated earnings rate. In reality, she has worked at least as hard as a woman who works outside of the home. This problem creates a great social inequity when housewives are left unprotected following a divorce.

Student: Would the revisionists advocate that the GNP begin to include the monetary value of various intangible factors which contribute to the total quality of life?

Dr. Jones: The critics basically argue that the current procedures overemphasize the financial aspects of our system.

Student: I've been having difficulty following which side of the argument you're taking.

Dr. Jones: That's the professorial function. I have attempted to outline the dimensions of the issue. My personal opinion is that the existing accounts should be improved but that they should not adopt new definitions. The need for more quantitative and qualitative information on the social aspects of our society can and should move forward without destroying our existing accounts.

Student: The revisionists are asking for a different system. This is the way you introduced it. They seem to want something other than the GNP. They must want a gross national wealth or something.

Dr. Jones: No, they want a MEW: a Measure of Economic Welfare.

Student: Would that be in monetary terms?

Dr. Jones: It would have to be stated in some quantitative terms and the existing common measurements use dollar values. For example, what is the value of the television programs we watch? We do not currently record an imputed value of television programs in the GNP. We do include the advertising expenditures used to support the programming. But the personal informational and educational benefits of watching television are not incorporated in the existing GNP accounts. These are personal benefits which have a value but which cannot be identified in dollar terms.

Another example of the difficulty of imputing financial values involves the use of air-conditioning. The capital investment needed to produce an air-conditioning unit is recorded. The finished unit is reported as a change in business inventories. The retail sale of the unit is recorded in the personal consumption sector. The energy required to operate the unit is recorded in the services account. But the personal enjoyment of being cooler does not have an imputed financial value for entry into the GNP accounts.

Student: I can identify the economic sacrifice I make to purchase, maintain, and operate an air-conditioner over a period of time. This is the value I ascribe to sitting around a room that's 72 degrees instead of 98 degrees.

Dr. Jones: And how did you arrive at that value?

Student: I arrived at it from the initial purchase price amortized over the entire utilization of the machine plus the energy that I had to pay for to operate the machine.

Dr. Jones: But all you've given me is one side of the account which summarizes the outlays. I definitely agree that those values are part of the National Economic Accounts. But how do you value the benefits? Each of us would probably place a different value on the enjoyment of air-conditioning.

Let me comment on one last category of activities which is difficult to evaluate for GNP accounts. If something is merely a necessity and it really doesn't improve the quality of life, should it be included in the Gross National Product? For example, should national defense outlays be included in the GNP? We spend $95 billion a year on national security. Is this effort only a "regrettable necessity" that should be deleted from the GNP?

Student: The purpose of national defense is safety.

Dr. Jones: How do you value that safety? You see, you're right back in the box of using an imputed value for an output value. Do you and I value defense the same way?

You could say that food should come out of the GNP accounts because it's just a prevention of hunger. It doesn't add anything. You could say that doctors' fees should come out because they don't add anything by simply preventing illness. This same argument could be made about all the so-called "regrettable deficiencies."

We have a set of GNP accounts which are measured in transaction terms because they are measurable values. You can find out what a television set was sold for. You can determine the value of the energy required to run an air-conditioner. You can measure how much is being spent for national security. We need these accounts stated in financial terms because such values serve as a common denominator. This approach gets us away from having everyone around this table making value judgments about the relative value of air-conditioning using different techniques. It is very useful to know what our economy has produced.

Decisionmaking

Of even greater importance, these National Economic Accounts become the basis for the economic policy decisions which are made every day. What should our monetary policy be? Should we tighten, continue, or ease the monetary policy? What should our Government spending programs be? Should they be larger, the same, or less?

They also guide policy decisions affecting taxes by recording the relative amounts committed to consumption and investment. The United States annually invests about 18 percent of its Gross National Product in capital goods. The Japanese invest about 38 percent. The Europeans invest anywhere from 25 to 35 percent. What does that difference mean? It may well mean a great deal in terms of our future trade relationships and our competitive position in the world.

We need to know how unemployment responds to Government spending. If unemployment begins to rise, and it probably will over the coming months, we will need a measure of current economic activity to anticipate future employment conditions. Over the last two quarters we have had a declining Gross National Product measured in real terms after eliminating price increases. When the real GNP is receding or growing at a rate of less than 4 percent, the economy is unable to absorb the approximately one and three-quarters million people who enter the labor force each year.

In other words, we need the Gross National Product to measure (a) what we have done, (b) what we are doing at the moment, and (c) how the pace of economic activity reacts to various outside variables such as an oil embargo, a worldwide decline in demand, or a crop difficulty. Such economic accounts are really the fundamental basis for all of our economic planning.

Going back to your question, is the existing set of economic accounts in any way inconsistent with knowing more about the results of health programs, the quantity and quality of the Nation's housing, or the number of people who have satisfied their educational needs? Is there anything contradictory about increasing the scope of our social statistics? Of course not.

My point is that it is not necessary to destroy or erode the quality or purposes of the existing GNP accounts to achieve the desirable goal of accumulating more information about the social aspects of society. I know that officials of the Bureau of Economic Analysis are constantly striving to improve the accounts. In fact, I would argue strongly that we could make greater gains by improving the current GNP accounts than we would by diverting our attention to trying to value television, air-conditioning or any of these other examples that we have discussed briefly. We don't need a different conceptual Gross National Product. Instead, we need a recognition that the GNP is not a measure of the quality of life. It has never claimed to be such a measure because it would represent only a partial indicator of the total status of our society. There is no true measure of the quality of life that I know of, because each of us has different values. I would place a very high value on relaxation or the chance to go home in the evening. Someone who works in a job composed of constant repetition might be more interested in gaining access to more interesting work. My wife might value air-conditioning for our car. So, how can one measure the quality of life?

What I want you to gain from this discussion is that the Gross National Product is useful, in a very specific way, for economic policymaking. But it clearly is not a measure of the quality of life. I would strongly support the expansion of programs seeking information on social issues as a basis for making difficult decisions about welfare reform, the health budget, educational programs, environmental standards, and the

like. However, the basic GNP accounts should not be used for the wrong purposes, nor should they be underrated as a measure of economic activity.

Student: That seems perfectly logical. That makes me wonder further, would the revisionists feel that all social planning, or planning in regard to trade, finance, recessions, or whatever, is distorted because somehow the GNP as it stands is inadequate?

Dr. Jones: I don't think the attack would be on the basis that it's a poor economic indicator. The criticism usually concerns the narrow scope of the analysis.

Mr. Barabba: Let's say the Administration comes out and says that they're going to set a policy of a 4-percent growth rate and all these items mentioned. Then they go out and they meet that rate and maintain it over a period of time. And they say, "You see how great we are." Well, the revisionist would say, "But, how great are you really? What have you done to the environment? How happy are people?"

Dr. Jones: The classic example involves the United Kingdom. About a year and a half ago they set a 5-percent annual growth goal for their economy. They did not achieve that objective. In fact, they are experiencing a negative economic growth rate in real terms at this time. The GNP accounts would record that result, but Government economists would probably argue that outside factors have interfered and the shortfall is not the result of poor policies. The social critic might go even further and claim that the economic results are not an effective way to describe social conditions in Great Britain.

Economists use the Gross National Product to indicate current economic growth rates and the current mix of consumption and investment. From these reports analysts can estimate the probable course of future economic events, but they cannot predict how the people will react to future developments.

We also need to know what the future holds. The Bureau of the Census tells us that in the 1980's this Nation will have certain work force patterns. They estimate that from 1958 to 1965, the work force grew about 1.5 percent each year. From 1965 to 1978 it is expected to increase at an annual rate of 1.8 percent. This small percentage shift has created severe employment strains. For example, teenagers comprise approximately 10 percent of the total work force, yet they account for over 25 percent of the current unemployment. This particular shift in the labor force has had a major impact on various manpower programs.

By the 1980's the labor force's annual rate of growth is expected to be only 1.1 percent. The surge of teenagers resulting from the postwar bulge of births will have been absorbed. Fortunately, the 25- to 30-year age bracket of the labor force tends to have much more stable work characteristics. Unemployment may be less of a problem in the 1980's, not because the people will be more skilled, better educated, healthier, happier, or any of the other characteristics measured by social indicators, but because, in a relative sense, there will be fewer new workers that will be entering the labor force.

Boiled down to the essential point, the economic system concerns providing jobs for people. The system is supposed to be for the people. During the 1980's the real GNP can increase at an annual rate of only 3.2 percent and still absorb the new entrants into the labor force. This reduced rate of economic expansion, which is significantly below the current target of 4 percent, will moderate some of the strains in acquiring needed resources and protecting our environment. This kind of information is extremely important in economic policy decisions.

Planning the Economy

Student: What is the outlook for inflation?

Dr. Jones: The United States has historically experienced a low rate of inflation, averaging 2 percent during the 1900's. Severe price disruptions have occurred as a result of wars, but the normal peacetime rate has been very moderate. Beginning about 1965, the pace of price increases started to accelerate, and eventually crested in 1969 at an annual rate of just over 6 percent. In response to the restrictive monetary and fiscal programs initiated in 1969 (including the income surtax passed in June 1968), the rate of price increases gradually receded. In 1972 the Consumer Price Index rose 3.4 percent. Unfortunately, prices again turned upward in August 1972, due to earlier fiscal and monetary policies which caused the economy to become overheated. The price indices literally exploded in 1973. There were many reasons for the surge of prices: food shortages, the quadrupling of oil prices, the convergence of worldwide demand pressures as most industrial nations expanded rapidly, and the accummulation of serious distortion created by 3 years of unfortunate wage and price controls.

Over the last 12 months the GNP price deflator has increased about 11 percent. This broad measure of inflation jumped 12.3 percent during the second quarter of 1974. The outlook is that this intolerable rate should gradually decline to a single-digit pace, but the improvement will be very difficult and painful.

With the notable exception of West Germany, where the current rate of inflation is 7 percent, most European countries are experiencing price increases at annual rates of 12 to 20 percent. Japan is suffering an even higher inflation and in some countries the increases are uncontrollable.

Student: Is the U.S. Government doing anything about this? Are they trying to stop it?

Dr. Jones: Economic policies are focused on the two most meaningful actions possible. The monetary policy has been moderately restrictive for over a year. Over the last 3 years the growth in the money supply (new currency and demand deposits in the system) has grown at an annual rate of 7 percent. In 1973 the increase was limited to 6 percent and a target of 5 to 6 percent is now feasible and desirable.

The Administration is also striving to slow down the momentum of the Federal budget outlays for fiscal year 1975 by establishing a target of $300 billion. This target still represents a massive increase of $32 billion over fiscal year 1974 and will result in the fourteenth deficit in the last 15 years. Nevertheless, achieving that goal would be a major step in regaining control over Federal spending.

Beyond these two fundamental policies, the Congress and Administration are always working on food, energy, regulatory, antitrust, and hundreds of other specific programs which, hopefully, will improve the efficiency of our economy and help moderate the unacceptable price pressures we are currently

experiencing. For example, policy decisions have been made to release millions of areas of croplands that were previously held out of production. After almost 40 years of artificially restricting agricultural production, we are now striving to maximize output. A major effort is going into the development of an effective energy program. The price of oil will never drop back to the old levels of $2 to $3 a barrel, but we can move ahead on developing new energy resources. In short, the Government is attempting to push a comprehensive package of economic policies which will gradually improve the situation, but we should not have unrealistic expectations that progress will be easy or quick.

Student: Won't these decisions ultimately amount to the old question of priorities?

Dr. Jones: The entire subject of economics focuses on the push and pull of setting priorities and allocating resources.

Student: Percentage wise, how have salaries gone up in terms of the budget?

Dr. Jones: I don't know for the total Federal Government. I do know that in the Department of Defense military personnel has declined from 3 million people in 1969 to a current level of about 1.5 million, while the payroll costs have doubled. For the total Federal Government, employment in 1969 totaled 2.8 million. Last month the total was surprisingly 100,000 lower than 5 years ago. However, State and local government employment increased by 2 million to a level of 11.5 million as of July 1974. Very few critics recognize that Federal employment has declined while State and local units have sharply increased their employee numbers.

Student: Is the U.S. economy dependent upon worldwide trade?

Dr. Jones: It is influenced by but not dependent upon it. Merchandise exports have traditionally represented about 4 percent of the GNP. This year, exports will amount to about 7 percent of our GNP. In many European nations exports account for 40 to 50 percent of their GNP totals. The United States is the world's largest exporter and importer, but as a share of our total economic activity, free trade is not as important as it is in most other industrial nations.

Student: Is it possible to have a stable international economy when inflation is so rampant?

Dr. Jones: The current levels of inflation are clearly disrupting international economic stability. Part of this serious problem involves the unprecedented jump in oil prices, but there are many other causes. As the head of the U.S. delegation to the recent meetings of the Economic Policy Committee in Paris, I emphasized the basic point that the United States has a major responsibility to stabilize its domestic economy as a basis for international economic progress. The situation is somewhat analogous to being in a canoe with an elephant. No matter how friendly or well mannered he is, if he makes a mistake, a disaster occurs. The U.S. economy is so large and important that we have a unique responsibility to provide worldwide economic leadership by pursuing responsible fiscal and monetary policies.

Student: How are your data systems being exchanged?

Dr. Jones: We exchange economic information at meetings of the Organization for Economic Cooperation and Development (OECD), the United Nations, the International Monetary Fund, and of many other international institutions.

Mr. Barabba: You might go into the reconciliation of trade statistics that the Bureau of the Census worked out with Canada.

Dr. Jones: That exercise is a good example. For many years U.S.-Canadian relationships have been exacerbated by disputes about the trade balance figures. Since each nation keeps its own record of both exports and imports, the disparities between the large trade deficit with Canada reported by the United States and the much smaller surplus figure reported by Canada have been a source of confusion and occasional irritation. For example, in 1973, the United States originally reported a deficit of $2.6 billion in our trading account with Canada for calendar year 1972. Canada reported a small surplus of about $0.6 billion in our trading account with Canada. As part of the reconciliation process, the U.S. Bureau of the Census and its Canadian counterpart discovered many problems of definition and interpretation. The cooperative effort of these two excellent agencies clarified these problems and resulted in an effective reconciliation of the figures. After adjusting for definitional problems, mistakes, and missing documents, the reconciled figures for 1972 indicate that the United States really experienced a deficit of $1.2 billion in its trading relationship with Canada in 1972.

Statistics should not dominate international negotiations, but it is important to get our facts straight before beginning to discuss policy issues. The Bureau of the Census is now talking to many other countries about similar reconciliation projects. This is the basic thrust of my message here today. Government officials try to establish monetary and fiscal policies on the basis of meaningful National Economic Accounts.

Student: On a long-term basis, if there is not a decrease in the price of oil, will the current economic policies have much impact in terms of righting the economy and bringing down long-term interest rates?

Dr. Jones: Fortunately, the United States is about 85-percent self-sufficient as to sources of energy. Nevertheless, the distortions caused by the sudden oil price increases have seriously disrupted our domestic economy. The effects have been devastating in many other countries.

Student: Won't the difficulties in other nations hurt our economy if they can't buy our products?

Dr. Jones: Economic distortions in other nations will restrict our exports in some situations; however, our food exports are experiencing increasing demand pressures and our traditional exports of high-technology products will continue. It is true that U.S. merchandise exports are currently running at an annual rate of about $90 billion, which is well above the 1973 total of $70 billion and the 1972 figure of $49 billion. Our shipments of agricultural products were about $20 billion last year. We certainly do not want to see trade wars or a serious erosion of our

exporting activities, even though the total figure accounts for only about 7 percent of our GNP.

Even more serious are the disruptions of financial flows. The Arab oil-producing nations are going to run surpluses in 1974 of $50 to $60 billion. They can import maybe $5 or $10 billion more, but that would still leave approximately $40 to $50 billion for investment. The other part of the issue is that advanced OECD nations will have trading deficits of $40 to $50 billion. The surpluses of oil-producing nations must somehow be "recycled" to finance the imports of oil-consuming countries.

Even more important than the "recycling" of oil earnings is the question of the price of oil. If oil prices remain at such high levels, the United States must turn to developing energy alternatives. This Nation has the technological capabilities to develop its coal, oil shale, and nuclear facilities, and to move ahead on solar, water, and wind-power solutions to the energy crisis. We can develop these long-term options, but the immediate problems for the lesser developed nations are extremely serious because they just can't buy oil with their limited resources. It is also a difficult situation for Europe, because they import about two-thirds of their energy needs, and for the Japanese who must buy about 99 percent of their energy resources. The current distortions caused by the sudden increases in oil prices are probably the single most difficult problem in the international economy at this time. Fortunately, trade is continuing, and we have avoided the international monetary crises that we experienced in 1969 through 1971.

Student: If you do all that you've talked about and implied, won't that carry a higher unemployment rate?

Dr. Jones: If business cycle fluctuations can be moderated by monetary and fiscal policies, then unemployment will fluctuate within a more narrow range. Unfortunately, economic policies have tended to add to either boom or recession because the programs are changed so frequently. This adjustment process is difficult because events tend to lag about 1 year behind policy changes. By the time the policy adjustments affect the economy, events have changed so that the shift exaggerates the underlying trends. A major reason for having more stable economic policy is to avoid the disruptive swings which create uncertainty in the private sector and lead to possible unemployment and lost investment. During the first quarter of 1973, the real GNP (price increases removed) was increasing at a seasonally adjusted rate of 9.7 percent. Incidentally, 44 percent of the American people felt we were in a recession at that time, even though we were growing at twice our sustainable annual growth rate. The economy obviously could not continue to operate at that intense pace, so fiscal and monetary policies were used to gradually cool down the situation.

Student: Wouldn't you want to show welfare spending in the GNP so you could forecast that a bit better?

Dr. Jones: Welfare expenditures are included in the Government spending accounts. A large portion of the outlays are reported in the State and local government sector.

Student: A couple of times you've mentioned taxes. But, in terms of reducing Federal spending, isn't there also the alternative of raising taxes?

Dr. Jones: Right.

Student: Is this policy avoided because the raising of taxes is so politically bad?

Dr. Jones: Changes in the tax code require legislation. History suggests that it is extremely difficult to increase taxes because it is hard to convince the American public that such drastic action is required to pay for all the spending programs demanded.

Student: There are a number of commentators saying that Government's preoccupation with Watergate has aggravated our inflation situation. Could you comment on that?

Dr. Jones: I think our inflation is infinitely more complex than that simplistic explanation. If it has had an impact I think it would be minimal. The uncertainties created may have curtailed consumer spending. The stock market apparently has also been negatively influenced by recent political events. As far as significantly influencing the underlying rate of inflation, I can give you all kinds of reasons that are much more important than the psychological impact of Watergate.

Student: What can we expect in the future with this new economic policy? Will the inflation rate go up for awhile, then curve down, and then turn back up? Will it ever level off?

Dr. Jones: The wholesale price index for July was 3.7 percent. If that rate were to continue for 12 months, it would result in a 50-percent gain in wholesale prices in 1 year. What happened was that prices of industrial commodities such as steel, copper, plastics, chemicals, etc., were influenced by the sharp increases in oil prices. The distortions created by oil price gains will be winding their way through the entire system.

For 4 months in a row farm prices dropped sharply. Then in June and July the weather destroyed many crops. Wholesale food prices in July went up 6.8 percent, which is the equivalent of an annual increase of about 84 percent. Prior to July, there were cross trends with industrial raw material prices pushing upward and wholesale farm prices declining. In July, rising farm prices reinforced the upward trend of other raw material costs. Farm output this year will not be as good as originally expected, but it will be better than last year.

One encouraging aspect of the inflation outlook is that energy prices are not going to quadruple as they have in recent months. In fact, there seems to be some evidence of an oversupply of crude petroleum, amounting to approximately 2 million barrels a day, around the world. Unfortunately, international oil decisions involve complex political issues. Oil-producing nations can partially offset pressures to reduce prices by cutting back their output. Certainly, the oil prices are no longer going up, and they may be cracking a little bit.

Based on the outlook for food and energy, we expect inflation will slowly and painfully moderate. It may sound as if I'm talking about a different world on the same day the wholesale price index went up 3.7 percent. But if you step back and look at the last 4 or 5 months, considering what you see in the economy and what you anticipate concerning food and energy, I think it's fair to say that inflation will gradually moderate if a tough economic program is sustained. By the end of the year, I don't think we will still be suffering double-digit inflation. But I could well be disappointed. In the United States an inflation rate of 2

percent has been our historical average. Today, if we could get it down to 4 percent, that would be a Nobel Prize winning performance. This achievement will not occur over the next few months. Nevertheless, we must strive to reduce inflation in order to avoid the social distortions that are already developing. Inflation is particularly hard on families with lower incomes. Unfortunately, a disproportionate share of our low-income families are from minorities that are still vulnerable to discrimination. People who are on fixed incomes and the elderly who must watch their savings eroded by galloping inflation while they wonder whether or not they will outlive their savings are also tragically affected by current price increases. Inflation is really a very vicious thing in a social sense.

Student: I was surprised that you said that the economists are now in general agreement about general policies.

Dr. Jones: They really are. It seems so obvious that we just have to require more fiscal restraint.

Student: You mean economists in the private sector as well?

Dr. Jones: Yes, and in the public sector.

Student: I was particularly surprised because everything I've read in the newspapers in the last few weeks has been on how the economists are in a quandary as to how we got into this mess and how we're going to get out of it. Nobody agrees on which is the right course of action.

Dr. Jones: I believe that there is a consensus about fiscal policy and the need to improve the efficiency of the system. There is some disagreement about monetary policy, but even here the range of views is relatively narrow. It's not that we don't know what to do, it's just doing it.

Mr. Barabba: Would Congressmen also accept fiscal restraints?

Dr. Jones: Most Congressmen agree about the need to better control the total outlays. There are individual disputes, of course, about which programs should be expanded and which ones should be cut back, but there is a growing recognition that the upward momentum must be controlled. In fiscal year 1974, Federal outlays totaled $268 billion. The original fiscal year 1975 projections anticipated outlays of $305 billion. That upward surge of $37 billion in a single year represents an increase of 13.8 percent in an economy which has had zero real GNP growth over the last four quarters and which has had only an 8.3-percent expansion of GNP measured in inflated prices. That kind of budget growth distorts the economy. Furthermore, fiscal year 1975 Government spending could very easily have risen to $310 or $312 billion if strong action had not blunted the upward surge of spending in this election year.

Fifty-four senators recently sent the President a letter calling for a reduction of $10 billion in this year's Federal spending, suggesting that such action would cut spending from $305 to $295 billion At that time the budget was on its way to $310 or $312 billion. It is interesting to note the first vote of these 54 senators. When the agriculture expenditure bill calling for several billion dollars was voted upon it included an increment of $250 million over the spending target. Of the 54 senators, 49 voted that day, and 33 of those voted for the increase, while 17 of them voted to add another $600 million. In a related action, 46 of the 49 voted for a program to guarantee loans to livestock producers. Last week they cut the Department of Transportation budget 3 percent across the board, however, they didn't mention that they exempted the highway trust funds, which account for 90 percent of the total.

Even though everybody seems to support a program of fiscal responsibility, the actions of governments must support the current rhetoric. Unfortunately, most governments do not have much credibility. Fiscal restraint must be actually demonstrated before most people will believe that the historical pattern of constant deficits will be reversed. In fiscal year 1969, approximately $7 billion was cut out of the Federal budget and strong monetary policy actions were adopted. The 6 percent rate of inflation that existed in 1969 was slowly reduced to a level of 3 percent by 1972. Progress can be made.

Student: But didn't the Consumer Price Index pretty well skyrocket during 1973?

Dr. Jones: The Consumer Price Index rose 8.8 percent during 1973 It is interesting to note that personal incomes increased 10.6 percent last year.

Student: What are the chances of Congress actually doing something about the Federal budget?

Dr. Jones: When one talks about cutting the budget, you really envision ranking all the projects. Let's say there are 60,000 Government projects. The economic approach would be to rank every one of those projects and then proceed to eliminate those at the bottom of the list until the necessary savings were accumulated. Do you know what you would probably find when you tried to eliminate the project numbered 59,990? You would discover three powerful groups: first, a very vociferous group of beneficiaries; second, a very antagonistic Congressional committee with oversight responsibilities; and third, a very strong and protective Executive Office agency responsible for running that particular program. It may sound easy to find likely projects for elimination, totaling at least $5 billion in a $305 billion budget. In reality, every attempt to reduce spending creates a strong backlash from all three of these groups. Nevertheless, a reduction of $5 billion of outlays during fiscal year 1975 would represent a cut of only 1.6 percent of the total Federal budget. It is hard to believe that a reduction of 1.6 percent could destroy any Government agency. Unfortunately, this crude across-the-board reduction cannot be used because most existing programs are required by legislation. This problem is particularly meaningful for those of us interested in the improvement of Government statistical programs. The desirability of such improvement is obvious to everyone who works with statistics. But we need to remember that such programs are expensive and they must compete against thousands of other priorities.

Mr. Barabba: Approximately $350 million will be spent on information-gathering activities in 1974. Did you indicate that the United States might be returning to wage and price controls?

Dr. Jones: No, I hope we don't. However, I do think that there will be extensive pressure for such action.

Student: Aren't there other suggestions for cutting down inflation?

Dr. Jones: There are at least four important approaches. First, we need more fiscal responsibility. Second, monetary policies should be more stable. Third, the Federal Government should act decisively to eliminate or reduce the inefficiencies and distortions caused by its own policies. Finally, some analysts believe that wage and price controls should be used.

Based on my analysis of the results of such controls in Europe and the United States, I believe that wage and price controls are not a meaningful way to control inflationary pressures. In fact, I believe that they create serious distortions. First, there are artificial incentives to export more domestic goods whenever uncontrolled foreign prices are higher. Second, controls delay or curtail capital investment which eventually contributes to supply shortages which increase price pressures. Third, there is a tendency to eliminate many low-priced items from the product mix. Fourth, there is a tendency for wage and price decisions to move upward to the permitted ceiling to avoid being frozen at a lower level.

Student: What if you just froze wages instead of prices?

Dr. Jones: You would have a general strike.

Student: Economically, it wouldn't be feasible anyway, would it?

Dr. Jones: I do not think so.

Student: How about consumer boycotts?

Dr. Jones: The consumers did boycott beef when it became too high-priced. Consumers should not waste money during good times or bad times. They should buy things that are lower priced. What we don't want is further erosion of personal consumption which has been flat for over a year.

Another serious problem involves the costs of energy. To avoid further capacity shortages, the current utility rates may well have to be raised to encourage capital investment and to provide the necessary capital. Thirteen utilities have already cancelled construction projects, most of which involved nuclear facilities. The current loss of capital investment projects will affect utility operations many years from now. The current situation is a great paradox. We obviously want to curtail inflation, but it is probable that State regulatory utility commissioners will have to allow rate increases to generate the necessary capital investment. The reaction of consumers to higher utility rates is naturally going to be very negative.

Student: I think one reason why consumers feel the way they do is that there seems to be, real or not, exorbitant profits for all kinds of companies, be they oil, dog food or peanut butter companies. When you stop eating meat and go to peanut butter, and then that price goes up on you, it is very discouraging. Companies all seem to say the same thing: "Unless I can make a certain profit margin, I'm not going to do it. Go elsewhere, or suffer." I agree with you fully that the American consumer is spoiled rotten and is terribly wasteful. We're beginning to suffer now and we're probably going to have to adopt different living habits, but who is in a position to deal with the profit motive? Or in many cases, the excess profit motive? If I have the correct figures, some oil companies, during the first two quarters, doubled their profits. Nobody is saying that they don't need money to continue to look for oil wells, but what do you do with a recalcitrant industry that says, unless I make a certain amount of profits, I will not invest? They simply claim that the "business of business" is to make a profit and if they don't, they will shift investments elsewhere. What do you do with that kind of an attitude?

Dr. Jones: Point number 1: Corporate profits as a share of national income have been declining over the last 10 to 20 years. They now have a lower share of national income than in 1937. Point number 2: Over any extended period of time, oil company profits have been about average compared with all U.S. industries. Steel companies are also currently reporting sharp percentage increases in profits in the last few quarters, but they have consistently been near the bottom of the list each year when industries are ranked according to profitability. Steel companies now face massive capital investment requirements, including very large commitments for pollution abatement programs. Over the last decade steel companies invested $17 billion for new plants and equipment, but they did not increase capacity because the funds were required for modernization and replacement projects and the pollution abatement requirements.

As to the oil companies, many of them are reporting very large percentage gains in profitability this year. Part of this jump results from the statistical impact of comparing a large gain during the first quarter of 1973 to a depressed profit report for the first quarter of 1972. Also, more than 50 percent of the 1975 profit improvement is accounted for by earnings on foreign oil operations. The companies do not believe that these results are representative of the long-term outlook. Unless a sustainable profit incentive is available, the oil companies will remain reluctant to commit the massive capital amounts required. Many basic industries have not added the necessary capital investments needed to avoid shortages.

Student: Don't companies receive certain advantages, such as tax breaks, for investing abroad? Are we that helpless as a Government or as a people, that we can often take certain measures to control the consumer but cannot control industry?

Dr. Jones: We can nationalize our industries, like the British steel industry or the European railroad system. But I think that you will find that a nationalized industry becomes a tax drain rather than a taxpayer. I strongly support the vigorous enforcement of antitrust laws, but I do think that our people will have to recognize that corporate profit incentives are lagging behind as the basic motivation required for domestic investment.

Student: Is that why the Government is stepping in and guaranteeing loans?

Dr. Jones: The Government has guaranteed loans for the Lockheed Corporation and certain defense contractors. A program to guarantee loans to livestock producers was also established recently, but such examples are relatively rare.

Student: There was an article in the **New York Times** that the lack of competition and the Government support for Lockheed and the livestock men is what's causing prices to remain high, and if you returned to a more competitive economy, you would have a drop in prices.

Dr. Jones: I would certainly support increased competition. Increasing productivity is also an excellent anti-inflation ap-

proach. In the case of the Lockheed loan guarantee, I was philosophically opposed to the decision. But there were some strong practical arguments in favor of providing support to prevent a corporate failure. It was claimed that 60,000 jobs would be saved. When the loan guarantee decision was made, California had an 8-percent unemployment rate. It is my understanding that Lockheed has not tapped the Federal Treasury for any funds. Nevertheless, when one borrower is granted a preferential advantage in arranging a private loan, other borrowers are placed in a disadvantageous position. The issue becomes particularly pertinent when some mortgage borrowers have to pay interest rates of 10 percent or more. The accumulated impact of Federal deficits also disrupts the financial markets because the Treasury must borrow large amounts of capital to finance the excessive spending. Because the Federal Government is the largest and most powerful borrower in the capital market, the individual mortgage loan is usually at the bottom of the list, just behind small businessmen. The impact of Federal deficit financing has not been emphasized enough to alert the general public as to its impact on interest rates and credit availability. These are just a few examples of the complexity of establishing effective Government policies, particularly programs to reduce inflation. The basic approach is to rely on monetary and fiscal policies along with specific actions to improve productivity, but it will take a considerable period of time to make significant progress in reducing inflation. Unfortunately, interest rates are not going to come down until inflation pressures are moderated, and, until interest rates decline, many serious problems in our business and housing industries will persist.

Student: One major alteration in the Federal budget might be a Federal health insurance program; do you think that adding $60 billion to the budget would be inflationary?

Dr. Jones: In 1969, the Council of Economic Advisors prepared a study which attempted to project the probable Gross National Product over the next 5 years and the specific claims that would be made against that output. Various assumptions were made about Government spending, business investments in plants and equipment, residential construction programs, and the traditional patterns of personal consumption which result in the spending of 91 percent of our personal disposable income on ourselves. The basic conclusion of that study was that the entire potential output was already committed to existing claims, even though the study assumed that a relatively rapid rate of economic growth would be sustained throughout the entire period. The obvious significance of that conclusion is that society will have to either curtail or eliminate something from its current portfolio of spending programs if new projects and different priorities are to be accepted.

Student: Is it a matter so much of new priorities as a way of redistributing?

Dr. Jones: It is actually a problem of restraining the upward momentum of the total budget and realigning priorities.

Student: No, I was going back to the health question. The Kennedy-Mills sort of proposal.

Dr. Jones: I don't know that much about the mechanics of that particular bill, but I thought the thrust of your question was: If it winds up with more spending, will that be inflationary? The answer to that is, yes.

Student: My point is that it isn't spending, per se, that creates inflation. I think we have to take into account, in terms of inflation, the ways it's being spent, both in the payment of taxes and personal expenditures.

Dr. Jones: I assume it would be somewhat analogous to Medicare and Medicaid. From 1965 to 1969, the daily cost of a hospital room increased 69.7 percent. Part of that remarkable increase was caused by the surge of demand for medical services and facilities without a corresponding increase in the number of doctors, nurses, hospital rooms, support personnel, etc. Economists would refer to this situation as an imbalance resulting from excess demand pressing against an inelastic supply. Again, I don't know that much about the National Health Program. I would emphasize that it is naive to think we can simply increase spending without eliminating other existing claims. Many people believe that large cuts in defense outlays would provide the necessary funds to pay for expanded social programs. However, it should be recognized that defense spending has already been sharply curtailed, particularly in a "real" sense when the eroding effects of inflation are considered. Social program spending is already well above defense spending. Further cutbacks in defense outlays will be difficult.

When I speak at university campuses, students often suggest that resources could be released by reducing business investment. This is a rather naive suggestion because such capital outlays are the fundamental variable in producing the future GNP. The historical advantage of the U.S. economy has been the technological competitiveness created by investment. Unfortunately, we now lag far behind almost every other industrial nation in the share of the national output being committed to current investments required for future growth. America has emphasized current consumption while needed capital investment has suffered. It has been estimated that the United States will need to commit over $3 trillion to new capital investment over the next decade. This an astounding estimate, but it can be accomplished if the rate of annual outlays is somewhat increased and the Federal Government does not usurp the capital to finance its deficits.

It is also possible to challenge the assumption that consumers will, or that they should, continue to spend 91 percent of their disposable personal income on themselves. I personally believe that this allocation of resources to current consumption is most short-sighted. It should be noted that the economist does not say that it is right to emphasize personal consumption so much. It is rather discouraging that we spend more money on beauty and barber shops than we do for religion, welfare, research, and educational activities. The economist must explain the repercussions of continuing the historical consumption trends. If society wants to spend less on existing types of personal consumption and more on other needs with longer term benefits, I would applaud that decision. But you have to go out and convince 213 million American people to do that.

Congress is now attempting to consider budget priority issues more carefully by creating a joint committee to evaluate Government spending. This new bill which was signed on July 24 gives the Executive Office authority to specify individual spending programs that should be delayed or eliminated entirely. The Congress must approve such recommendations before the adjustments can be made. If the electorate could really communicate to their Congressmen and the Executive Office that they want Federal spending to be more controlled, then some fundamental changes might occur.

PROFILES OF SMALL URBAN AREA CHANGE

Richard Hanel, Director of Public Relations, R. L. Polk Company

"You cannot judge a city in terms of its total complex. You've got to take it apart and look at the pieces. Further, no two cities are alike, even though some of the totals may look alike. Cities are just like people. They have their ins and outs, ups and downs, and pluses and minuses—some react quickly while others move slowly, and they react in their fingers and their toes. They are virtually unpredictable when it comes to small area year-to-year change."

Richard Hanel

Mr. Barabba: The speaker this morning is Mr. Dick Hanel of the R. L. Polk Company, one of the oldest companies in the information business in the world, and one of the few that is still privately owned. Since 1967 I'd been hearing about Dick Hanel and finally met him after I became Director of the Census Bureau.

He came to the Bureau one day and gave a presentation which was of interest to the Bureau. He showed our professionals what Polk was doing with statistics based on the information generated from data in its city directories. Polk wasn't calling these statistics social indicators; yet, they were clearly indicators of certain phenomena within communities. Polk has a unique capacity for providing current data because they're out there surveying most metropolitan areas once every year.

Mr. Hanel: As Mr. Barabba said, the Polk Company started publishing city directories over 100 years ago, and directories remain, to this day, the biggest part of our business. We also publish bank directories, motor vehicle statistics, and so on. So, basically, we, too, are in the information business.

This morning, I'm going to be talking about that part of our business called urban statistics which is a byproduct of our city directory operations. In order to set the stage, let me describe the city directory.

It's a reference book which costs the customer from $35 to $155, depending on its size and the area covered. Directories consist of three sections: An alphabetical listing of people, a classified business section, and a listing of addresses in street and house number sequence. All together we publish about 1,200 different directories containing information for about 7,000 cities and towns. Most are published annually.

The information in city directories comes from a door-to-door canvass. We don't ask for a lot of information, and everything we ask at a household—with one exception, number of children—is printed in the directories. Our questions are very simple. What is the name of the head of the household and what is his wife's name—the latter question immediately sets up marital status. What are the names, job titles, and employers of everyone 18 and over in that household? We ask for the number of children in each household, if the home is rented or owned, and the phone number. We also collect information on type and location of the business and professional establishments in the community.

That's the data base we're going to discuss. From this data base, using computers, we compile small-area inventories of the housing, the people, and the businesses in cities. More importantly, we report on the year-to-year changes that are taking place. My main mission this morning is to introduce you to that dimension of change.

It is our conviction that change is really the name of the game, not just change in city totals, but change in small areas—neighborhoods. The rates and geographic patterns of change are so vitally important in understanding what's going on in cities that we call our product "profiles of change."

Our statistical operations are frequently compared to the Census Bureau, and some people have even said that we're competitors. We don't look at it that way at all. We're only competitors in the very, very, limited sense that we do some of the same things. Both Polk and the Census Bureau publish statistical information about cities, and people frequently compare our information with the census counts of 1970. Actually, there are more differences in what we do than similarities, and I would like to describe a few of those differences for you.

First of all, the Census Bureau collects its information primarily for the purpose of compiling statistical data. On the other hand, we collect our information primarily to publish city directories and to make a legitimate profit on the sale of these directories and the advertising they carry. So, the statistical work that we do is a recent byproduct of a commercial enterprise that has been going on for a hundred years.

Secondly, the Census Bureau investigates deeply in the course of some of its probes. On the other hand, we work with only a very few items which are essentially the public face of the individual; this is the same information we have been collecting and publishing for many years.

The third big difference between us and the Census Bureau is in the economics of the finished product. If the Bureau is asked to go out and do a special census of a city today, they will charge about 50 cents per person to make a survey from which they will give the city census tract population counts, with breakdowns by sex and age, race and ethnic group, and so on. That 50 cents per person comes to about $1.50 a household if you assume three persons per household. By virtue of the fact that our statistical information is the byproduct of the ongoing city directory operation which has already paid for itself, everything that we are going to talk about today—dealing with housing, people, and businesses, inventory information plus the change calculated from two surveys—can be provided to a city for less than 15 cents a household. This price puts it very much in the ballpark in terms of the kind of current viable statistics that a city can afford, although our information would be limited to the information in the city directory.

This is a good example of the point that Mr. Barabba has

stressed, low cost byproduct availability of data is going to become a very, very important factor in the dissemination and use of vital information.

People ask us what kind of a sample we get. Well, our objective is to get as close to a 100-percent complete coverage as is possible and, in fact, we are generally successful in making contact with about 90 percent of all the occupied housing units in a city. The contact rate will go higher in certain more stable neighborhoods; it may be lower in poorer neighborhoods and those with a fast turnover, but we've never seen it below about 65 percent. Those who are expert in statistics and sampling tell us that this should be a very representative sample.

I'm not going to belabor this background anymore, except to say that, nationwide, our directory people knock on the doors of 27 million housing units every year. We have statistics on the central cities and most of the suburbs in 209 out of 253 SMSA's (standard metropolitan statistical areas), including some big cities like Detroit, Houston, Boston, and Washington. We don't make directories for Los Angeles, New York, Chicago, Philadelphia, or Baltimore. The economics of doing city directories in some of these large cities just does not pan out. I think that sets the stage for you.

From now on we're going to show you some of the things we've learned about the "profiles of change" in cities.

Possibly one of the most interesting things about cities is the rapid rate of household movement. We measure it in terms of the number and percentage of housing units that have had at least one family move in or out in the time between two directory canvasses.

As we measure it, there are five components to this rate of change. First, how many housing units which we found occupied at the time of the first canvass are now vacant? Second, how many went the other way, from vacant to occupied? Third, how many newly constructed housing units have been occupied? Fourth, how many previously occupied units have been vacated and demolished? Fifth—and usually about half of the total action—how many housing units have seen at least one family move out and another move in from the time of one canvass to another?

In most cities, we have found that from 25 to 35 percent of all housing units have had at least one family move in or out in a year's time. We've even found a few cases where the city-wide movement rates were from 45 to 55 percent! And when you get down to the census tract or neighborhood level, the change rate frequently runs into the 60 to 80 percent, and even higher.

In some cities and neighborhoods, rapid move rates have meant a drastic, radical change in family counts and demography. In other cases, families move, but the demography profile of an area stays pretty much the same. There's no depending on it.

This is why, as one of the few generalizations we permit ourselves, we say that you cannot judge a city in terms of its total complex. You've got to take it apart and look at the pieces. Further, no two cities are alike, even though some of the totals may look alike. Cities are just like people. They have their ins and outs, ups and downs, and pluses and minuses—some react quickly while others move slowly, and they react in their fingers and their toes. They are virtually unpredictable when it comes to small area, year-to-year change.

For these reasons, the other generalization we feel somewhat safe in making is that no one providing statistics is by that fact alone qualified to understand what is happening in a city. It takes a terrific dose of local knowledge to interpret the numbers and to assess their meaning and importance, and we try our best to keep our role in this whole business to that of submitting a report to our client cities.

How do we report the data? We almost always work in the dimension of the census tract, which is the base point most people prefer as a building block. We furnish 22 statistical tables and over 500 counts, percentages, and ratios for each census tract, all generated from that small data base that we talked about. One of the reasons for the amount of numbers is that we're dealing in the dimension of location.

The second thing that we do for the city is to gather key information in terms of maps. Location and patterns in the data are vital, and the best way to see them is with maps. We print over 300 computer maps for each city, dealing with as many counts and percentages and covering all subjects. Today, you're going to see maps, for example, dealing with vacancies in our example city. Anybody who wants to can probe the subject of vacancies using maps.

Now, on the subject of social indicators, we're doing something crude, simple, but extremely effective. For each small area, such as a census tract, we pull together on one page of the report 56 key counts and percentages. Then we rank each census tract in the city on these counts and percentages, for example, percentage of heads of household with no jobs. The tract in the city of 100 census tracts with the highest percentage of the jobless gets the rank of 1. The tract with the lowest percentage of jobless household heads gets the rank of 100. And we do this with the computer for each of the 56 counts in each one of the tracts.

This very simple rank order is proving to be something that people can understand, and it is turning out to be the common denominator for many things, providing rudimentary social indicators in terms most people can comprehend. Factor analysis is great, regressions are fine, but people don't understand some data conclusions, and don't know how to read others. But people can understand simple rank order.

Now I want to talk about the way we account for change. We rack up the information in terms of inventories and rank orders. Basically, what we do is take this year's computer tape for a city and using the computer, almost literally lay it on top of last year's tape. We make an address-by-address, family-by-family comparison of what we found this year versus what we found last year in terms of the components of the changes that have taken place. We're not just looking at the difference in the counts of vacancies or the net difference in households as of two points in time. We're looking at the input and the output, the flow, the velocity of that change and its components. That's the important thing.

Information Use

How are cities using information on change? First of all, much of the current legislation in Congress with respect to cities is toward block grants as distinct from categorical grants. (Note: the Community Development Act has since been signed into law.) The old way of doing things allocated so much money for model cities, so much for sewers or urban renewal, in other words, to specific programs. This discouraged local initiative in the use of money except within that framework.

The thrust of the Community Development Act is to give the city a block grant, which is one, big, fat check. You've heard it called revenue sharing. It is up to the cities to determine where to put their priorities, money, attention, and effort. Cities are using available information to set their own priorities and sort these problems out quantitatively. Cincinnati has been doing a lot of work in the area of neighborhood priorities.

The second thing, of course, is that once you have a feel for change, you can start to develop programs and strategies that take into account the forces at work. Again, for 3 years Cincinnati has been developing and refining a neighborhood-by-neighborhood housing strategy.

Thirdly, and we don't want to overstate its present capability, there is evaluation. There can be some fairly straightforward evaluation. Substandard housing can be removed, but you have to be able to measure your relocation needs and capabilities, and the results of the moves in terms of both housing and people. It's not an easy thing to do unless you have some pretty good numbers. Norfolk has some excellent results to show for its efforts in housing and social programs.

Among the most important elements of planned community growth is communications—being able to talk to the people involved in, or affected by, these programs and to explain what's going on and where people or programs stand. Milwaukee, Wisc., one of the best examples, has a very active neighborhood development program. Its been getting into all kinds of problems, social, housing, health, and so on, by using numbers to explain to neighborhoods, "This is where you are." People stopped speculating on how bad the situation was, and found themselves instead, and very quickly, with some hard numbers, trying to do something to change the objectionable ones.

I'm going to show you three things today, first, some of our maps to give you an idea of the sweep of things and how change can affect one town.

At the end of that presentation you'll see how quickly small-area change can affect events at the census tract level. I'll try to demonstrate how some statistically unimportant numbers can be extremely meaningful in the art of understanding neighborhoods and anticipating problems before the problems overwhelm the occupants and the decisionmakers.

Finally, you'll see a time series for one city which illustrates the movement and force of some of the basic trends that are at work these days.

You'll recall, a few minutes ago, we were talking about the velocity of change, the percentage of housing units in cities involved in some kind of change of occupancy. The numbers on the following maps are printed by the computer. Over the printout we lay a transparency which shows, in this case, the outline of the census tracts. The whole thing is simply reduced to 8½" x 11" size; and we give each city about 300 different maps. In about 2 hours you can run through 40 key maps for a city, mark them up to show the highs and lows and patterns—the sort of thing we're showing you here—and get an overview of what's going on in the city.

Here's the city of Milwaukee (map 1). Of Milwaukee's 230,000 housing units, 27 percent had at least one change of occupancy. The shades of gray indicate the percentage of all housing units in a single area that had at least one family move in or out.

The pattern is fairly common. Usually, the high move rates are found in two places, around the central business district, which you see at the east central part of town, and where new housing developments have been constructed, in this case in the northwest.

Here's the city of Cincinnati (map 2). Cincinnati's move rate is nearly 10 percentage points higher than Milwaukee's. Again we find the areas with high move rates, 50 percent or more, around the central business district. The more stable areas are out toward the periphery of town. But note that it's generally a more busy looking pattern.

Here's a complete change—San Antonio (map 3). There is the same 37 percent overall movement rate that we saw in Cincinnati. This exemplifies what happens when a city builds a ring road around itself—lot of new construction around the periphery of the city, with the usual high move rate in the center of town.

Next is the granddaddy of them all, Houston, Tex. (map 4). The move rate is 44 percent with still a different pattern. Concentration of change is in the business district, the center of town. But, here we see a spoke-of-the-wheel pattern reflecting growth along the major arteries which radiate from the center of Houston.

We have seen city-wide movement rates as high as 50 to 55 percent particularly in Colorado Springs, El Paso and Corpus Christi.

Now we're going to take a closer look at a midwestern city that we'll call Midtown, U.S.A. (map 5). Here we're back to a 28-percent move rate, with the usual concentration of action around the central business district (CBD).

Now, what's going on beneath this 28-percent move rate, which is well within normal range? Midtown has about 60,000 housing units so the 654 new ones equal a 1-percent increase added by new construction concentrated in the eastern part of town.

While that was happening, about 400 housing units were lost due to demolitions, mainly in the center of town, around the CBD. Watch that area because that's where we're going to see a lot of action.

We also measure change in the housing unit count which does not involve new construction, demolitions or even a change in vacancies. This is your single to multiple family residence conversions—two families living in a house where there was one before with no identifiable change in the vacancy situation. Note that this is Midtown's biggest change of all, a net increase of 943 housing units. But, again in the CBD.

Now, here is an example of how fast change can occur. In the previous year, instead of realizing an increase of 943 new units, the city suffered a loss of 429 units in precisely the same part of town.

When you add it all up—new construction, demolitions, other change—Midtown had a net gain of 1,200 housing units in two hunks (map 6). In the eastern part it was primarily new construction. In the central part of the city there was mainly non-physical change.

The next component is vacancies. It is not unusual to find that, of the more than 600 newly constructed housing units, 139 were vacant when we made our canvass. Of the more than 400 housing units lost to demolitions, about 200 of them, mostly in center city, had previously been vacant.

But here is the important one. Within existing housing there was a net increase of 437 vacancies (map 7), concentrated in the same central part of town where we found the increase in housing units from sources other than new construction. This is the sort

of thing that you sometimes find in areas undergoing rapid transition—an increase in vacancies in existing stock and doubling up going on at the same time. Meanwhile, vacancies were down in the southwestern part of the city, reflecting absorption of new construction from the previous year.

Add it all up for Midtown and there's a net increase of 400 vacancies with the important rise in the center of town.

You may recall that there were 1,200 new housing units. Offset that with 400 more vacancies and you have a net increase of 800 in the number of occupied housing units or households, with major small-area change showing gains only (map 8).

And again, just to show you how quickly things can shift, the previous year the change in households was plus 291, with a pattern that shows both plus and minus areas, including abdication of a lot of housing right in the center of the city.

The next thing we find is that despite an increase of 800 households, Midtown lost nearly 200 people as a result of households moving in and out. This reflects the general trend toward smaller households, including increases in the number of one-person households. This kind of population loss is very measurable, and usually takes effect in the areas surrounding the CBD, the older parts of the city.

Here we have a good example. In one census tract, 578 households were moving in at an average size of 2.22 persons per household. There were 576 moving out, virtually a draw in household count. But the average size of the families moving out was 2.45. That difference between 2.22 incoming and 2.45 outgoing was enough to account for a loss of 134 people in one tract, even though the number of households remained almost precisely the same. We find this frequently.

In Midtown's demography, first, we find 20 percent one-person households, pretty much what the Census Bureau finds. But against a gain of 800 households total, the gain of 441 one-person households is far more than proportionate.

Next, households with children number 42 percent. The interesting thing is the rather large concentration of households with kids in the center of town. Usually you find these families closer to the periphery. Then, against a city-wide gain of 800 households in total, there were only 156 more families with children.

The theme of your meeting is social indicators, and here is one that is getting a lot of attention, female heads of house with children. In Midtown the rate is about 7 percent, a normal figure in most cities. More important, we find a gain of 225 such households as a result of movement. This is interesting because it exceeds the total gain of households with children.

Retired heads of households number 21 percent, slightly higher than usual. The important thing, though, in Midtown is the loss of 262 retired heads of house in the central part of town.

For jobless heads of house, our counts and rates exceed the unemployment rate as the Bureau of Labor Statistics defines it. Our figures also include people who are unemployed but not necessarily currently looking for a job; people on welfare; divorcees and others, but not students or retirees who are not in the labor force. The 10 percent that we found in Midtown is pretty much in line with the nationwide rate of the Census Bureau. The important thing in Midtown is, of 800 more households, there is an increase of 700 households headed by people jobless or not in the labor force (map 9). We are finding this sort of thing in most large cities. In Midtown, it's important that much of this change was concentrated just to the east of the city. The poor area is the highly mobile area.

However, we don't suggest that people use our data as the last word. First of all, it will have changed already by the time they use it. Secondly, perfectly precise data need not be used for planning most major programs or strategies.

The important and unique thing in our data is that it shows short-range, small-area change. This is the vital dimension. Change data plus the inventory counts make it possible to see the main patterns and trends and identify areas that may need further investigation.

In Midtown, homeowners number 66 percent (map 10). That rate nationally fluctuates from 45 to 65 or 70 percent. Homeowners are normally found near the periphery of the city.

The important thing is the loss in this city of 500 homeowners versus a net gain of 500 households, in the area east of the high vacancy neighborhood and in the same vicinity where we noticed the loss of retirees.

By contrast, we find a gain of 1,300 units rented. The main shift from households owned to rented occurred in the central part of the city, a frequent but not universal characteristic. In a deteriorating area people in need can't afford to buy a vacated house, while it just isn't attractive to someone who can afford to buy. So it becomes a rental unit.

Student: Do you know what happens to that owner? Do they become a renter in the outer periphery of town?

Mr. Hanel: We don't know today, but the potential is in the data to find this out. There are several things that can be done that we have not yet had a chance to do. One of them is this very important question—the so-called chain of moves. What happens? Where do people go? Why? People talk a lot about the "chain of moves," and there's a lot of speculation about "filtering" and "moving up," etc. But, relatively little factual work has been done on that subject, particularly involving large areas and numbers of cases.

One of the important things that we can furnish is an address-by-address tape showing precisely what we found the current year and if there has been a change from the previous year. From that tape you can identify the new movers—you find the addresses into which someone moved. You call these people on the telephone and say, "Where did you come from?" You get their previous address and you call the people who are now there, and you start tracking backward. This, we think, is going to be one of the important byproducts of this whole business.

For the purpose of this discussion, the example we just gave also raises the subject of being able to do selective low cost samples from the detail files.

Some time ago people at the Department of Housing and Urban Development said, "Your vacancy data are great but we'd like to know two more things; how many bedrooms are there in these units and what is the sale or rental price?" So they took four cities and, using our vacancy listing, went to the local telephone company and said, "Here are some addresses. Have any of these since been occupied and do they now have telephones?" Most of them had been occupied in 2 or 3 months—the turnover of vacancies is fast. They took the phone numbers and for 50 cents a household they made calls, got the information on the number of rooms, the sale or rental price, and other information, and tabbed it up.

Take the journey to work. We have the name of the employer in the household record and this can be cross tabbed with the business file to set up a matrix at the tract level. We're

starting now to have the time and the facilities to get into these sort of things.

The next subject is income. People in the cities always want us to ask questions on income. We don't even try for two reasons: Income is a very, very difficult thing to determine, and we know darn well that we would have doors slammed in our face all over the place if we asked income questions, which certainly would be in the area of personal privacy. However, Mr. Barabba and his friends at the Census Bureau came along and gave us the kinds of answers we need. They are now publishing a series of data, based on a nationwide sample survey, showing total household money income according to the occupation of the head of the household. As a sample, this series takes into account the fact that a household with a jobless head might have two or three workers and sources of income, whereas a household headed by someone who is retired possibly has only social security benefits.

The latest available Census Bureau numbers show average total household money income was about $11,300 nationwide. Doctors, it turned out, had the highest average household incomes, about $34,000. We converted doctor dollars into an index number by dividing $34,000 by $11,300, and used the answer (303 percent) as the index. In this way, we compute index numbers for 21 categories of households according to the breadwinner's occupation.

We do a number of things with the index numbers. First, we compute a very simple arithmetic mean or average index for each census tract and the city as a whole, in all 21 categories. In Midtown, we found that the citywide index reflecting the occupational mix of the heads of house was 102, or slightly higher than the average of the national sample.

On map 11 we show those census tracts in Midtown where the index number was 112 or more and where it was 92 or less—roughly the high and low income areas.

Second, we compute the average income for movers-in, and for movers-out and compare the net difference between the two. Using these differences you can get a very clear view of where the major changes in the high counts tend to stretch to the east.

Also, we calculate the available housing stock. According to HUD, a minimum of 1.5 percent of the total owner-occupied housing stock should be vacant and available for sale to take care of normal turnover. Despite Midtown's 7-percent overall vacancy rate, there are only 300 such housing units for sale. These, too, are just east of the low income trouble area that is seeing so much action (map 12).

The other side of the coin, vacancies for rent, is another story (map 13). There are about 800 housing units available for rent over and above 4 percent of the renter stock and they are smack in the middle of the low income area.

We break down our vacancies into two kinds. First, we have two-canvass vacancies, which are housing units vacant at the time of each of two annual surveys. There's no guarantee that someone didn't move in or out during that period, but usually there have been no tenants. Where we find high rates of such vacancies, you're apt to have deterioration, dilapidation, or abandonment. In Midtown, the tracts with 50 or more such vacancies are centered in the low income areas. They generally go together.

The counterpart of two-canvass vacancies are those housing units either occupied at the time of the previous canvass and now vacant, or newly constructed and vacant—current-year vacancies. This should be your viable housing stock. In Midtown we find out that there are about 2,700 current-year vacancies, which is about 4 or 5 percent of the total housing stock. All but one of the low income tracts have high counts of current-year vacancies. This is a good example of the importance of breaking down the totals to find out what's going on.

Those of you dealing daily with urban affairs know one of the big problems is housing. And it's going to be a bigger problem as time goes on, considering high construction costs, high interest rates, high everything.

Right now, and particularly in center city Midtown, housing construction is almost stagnant. Pressing questions for the next few years are how much viable housing stock is in the city, and how do we make the best use of it. Midtown has a 7-percent total vacancy rate and by normal standards some people would say the town is in pretty good shape on vacancies. But, discounting the two-canvass vacancies, the fact most of the current-year vacancies were located exactly where nobody wanted to live shoots the 7-percent surplus! This is occupational mix taking place. It's turning out to be a very sensitive kind of rating of neighborhood stability.

The income index numbers are proving to be important in understanding residential vacancies. Midtown has nearly a 7-percent vacancy rate and that's mid-range. We're finding everything from 3 or 4 percent up to 13 percent. The city-wide 7-percent vacancy rate looks like this (map 14): 12 census tracts have 10 percent or more vacancies, ranging as high as 29 percent, and 10 of the 12 are in the low income area.

We also map some aggregates of the income index points to determine concentrations of household income in Midtown. Next, we see where changes in total household income took place as a result of changes in the number of households, or average household income. City-wide, Midtown's $10 million increase in household income is concentrated primarily in areas with higher household counts. It's important that no tracts show significant decreases.

These diagrams of aggregate income lead us into a look at Midtown's professional and business community. You can't neglect the supporting businesses and services when you try to understand the forces at work. Midtown's business and residential communities remain pretty much segregated. While most of the commercial vacancies are centered in the CBD they're spilling over into some of these areas where the income is concentrated and growing.

More important, the number of professional and business establishments declined during the year, influencing some of the areas where the number of people, households, and the aggregate disposable income were increasing. More cities are beginning to consider these factors, and talk to their business community in terms of the need and opportunity for supportive services. The summary map includes detailed counts of inventory and change for a number of types of business. However, this area needs a lot more work and understanding.

Earlier we talked about rank ordering of all tracts in terms of each factor. Of those 56 factors, we have found 8 that turned out to be extremely sensitive and useful as indicators of the general health and well-being of a neighborhood. First is the percentage of housing units that have had a change of occupancy. The second factor is the percentage of housing units that are vacant, excluding new construction. Third is the percentage of two-canvass vacancies. Fourth is the percentage of business vacancies. Fifth is the average income index with the lowest given the rank of one. Sixth is the percentage of jobless heads of households. Seventh is the percentage of female heads of house with kids. And last is the percentage of one-person households. Rankings based on these eight factors have helped identify and quantify a city's priorities.

The conclusion of our rankings is that a lot of the change in Midtown is taking place in the areas where big problems currently exist, and generally, the change is not good.

The second major thing I promised was to show you how quickly small-area change can affect and characterize a census tract. Here we're getting into some of these so-called "non-statistically-sound" kinds of techniques. But, it's the kind of approach that illustrates the importance of local knowledge.

We're going to be talking about three adjacent census tracts in Midtown (table 1); one (tract 32) is in the southeast corner of the critical area that we talked about. Each is heavily populated, ranging from 1,200 to 1,800 households.

Table 1. COMPARISON OF SMALL-AREA CHANGE

Characteristics	City	Tract 32	Tract 33	Tract 34
Number of households.....	61,156	1,793	1,159	1,714
Income Index.....	102	92	111	118
Current Percentages				
Housing units with change of occupants.....	28	37	25	15
Jobless household heads.....	10	23	11	3
Female household heads with children.....	7	20	13	3
Vacancies.....	7	10	5	2
Total.....	52	90	54	23
Net Change in Counts				
Households.....	(NA)	49	1	-10
Jobless household heads.....	(NA)	75	18	-5
Female household heads with children.....	(NA)	51	22	7
Renters.....	(NA)	110	36	2

Now we do something that makes a statistician shudder. We just add up the percentage of housing units with change of occupancy, jobless heads of households, female heads with children and units vacant. For our first tract, the sum of the four is 90 percent; next door, it is 54 percent; farther away, 23 percent. City-wide, the total is 52 percent.

There you have the current status. Three tracts—one of them is obviously in trouble; another, by the current numbers about average; and a third much better than average.

How about trends? Tract 32 shows a net increase of 49 households, mainly from doubling up. Against that, an increase of 75 jobless household heads, an increase of 51 female breadwinners with kids, and a shift from owner to renter results in a net increase of 110 renters. There's a tract already in trouble and cntinuing to head downward as evidenced by the lower income and impermanence.

In tract 33, our average tract, the number of households basically didn't change, but jobless heads of households increased by 18, the female heads of house with children increased by 22, and the renters grew by 36. Read by the numbers—later confirmed by local knowledge—here's a tract that's average in terms of where it stands today, but starting to hit the skids.

Seeing tract 34 your antennae begin to quiver a little bit. This is one that's still well off, but vacancies increased by 10 households. Heads of households who were jobless decreased by 5 but, female heads of house with kids were up by 7, and an increase of 2 from owner to renter in the face of all that. A mixed bag of small changes adding up to a neighborhood that they're going to want to watch because it could be in the way of the wave of deterioration.

Table 2 shows you some time series for the city of Norfolk, Va. I pulled together this time series because I thought it interesting to see what happens in a well-managed city in terms of trends. They started with 260,000 people in 1970 (excluding military living on base) and 3 years later were down to 248,000, while the number of households stayed about the same. The explanation is the family size which declined steadily from 3.11 to 2.95.

Look at the number of housing units, down from 88,800 to 87,200, not a lot of net change to be sure. But look at the amount of new construction—1,500 units in 1971, 1,700 in 1972 and 2,000 in 1973.

Table 2. PROFILES OF CHANGE COUNTS NORFOLK, VIRGINIA

Characteristics	1970	1971	1972	1973
Population.....	260,500	252,600	249,200	247,800
Housing units.....	88,800	87,300	86,700	87,200
Units added by new construction.....	(NA)	1,500	1,700	2,000
Percent of units with change of family.....	(NA)	41.3	37.9	36.4
Households.....	83,600	82,000	83,000	83,900
Persons per household...	3.11	3.08	3.00	2.95
Vacancies.. number..	5,200	5,300	3,700	3,300
percent..	5.7	6.0	4.3	3.8
Two-canvass vacancies.....number..	(NA)	1,500	1,200	900
percent..	(NA)	1.7	1.3	1.0
Current-year vacancies..	(NA)	3,800	2,500	2,400
Current-year vacancies vs. desired minimum....	NA)	1,240	44	-38
Current Percentages				
Household with children.....	48.1	48.1	46.8	46.1
Female heads with children.....	8.4	8.5	8.6	9.4
Retired heads of household.....	12.0	12.1	13.1	14.4
Jobless heads of household.....	11.0	10.9	11.1	12.0
One-person households...	13.6	13.6	14.9	15.7
Renters.....	53.6	53.4	53.6	53.7

Student: That could also indicate a shift, destroying older houses, and things like that.

Mr. Hanel: Exactly. And if you look at the next line you will see one of the results—and this is one of the best signs in the whole business. By 1973, their total vacancies were down to 3.8 percent, which is extremely low, because they have removed a number of unusable vacancies. Two-canvass vacancies are steadily down. Current-year vacancies are below minimum levels. They cleared out the substandard housing in the old section of town. So there's a very effective measurement of the results of an aggressive kind of clearance and rebuilding program. They turned their new housing into occupied housing, while getting rid of the old stuff that was just sitting there.

On the other hand, by any standard, housing is extremely

tight in the city, and in today's situation that could be considered poor planning. But again, where you have few vacancies, you generally have less problems of other kinds.

Mr. Barabba: A good point to make here is that when one says something is an indicator of something good, we have to ask, in whose eyes is it really good? That's one of the problems with social indicators.

Mr. Hanel: A point was made that these eight indicators are negative, and they are to the extent they were designed to try to pinpoint the areas which might require priority attention from the standpoint of problems. The other side of the coin is, what would be the positive indicators in a city? Is it low ranking on the same eight factors or a whole new set?

We get a lot of feel by looking at reports and maps, but I'd hesitate to interpret the numbers for a city without a lot of local background and knowledge. You can't avoid pointing out certain things that stand out from what you learn to expect. But even the level of vacancy rates, for instance, must be read against move rates, local programs and attitudes regarding land use, and clearance. Interpretation needs a heavy dose of local understanding, and this is a different dimension from reporting.

Student: In learning to interpret the data and extrapolate from what you have, do you find a political problem in addressing people within a city? Do they like you wandering in the door and saying, "Look, the place is going to hell in a handbasket. You'd better do something!" Or do you have to nurse them around to the viewpoint of understanding?

Mr. Hanel: It depends on the people involved. You can run the gamut from the absolutely enthusiastic top man, to the apathetic, to the "don't tell me about problems" types. The big question mark in this whole thing and the question we run into frequently is, "O.K., so we know all this. Now, what do we do?" I'm not sure anybody knows that answer. But I'm sure of one thing—the first step the "doers" are taking is to find out what the situation is and what forces are at work.

Mr. Barabba: Let me add a couple of things. One is that within the Bureau we have established what we refer to as the Census Use Study. And we have, throughout the country, including here in Los Angeles, research going on. In Indianapolis, we have what we call the Uses Program. Anytime anybody in the metropolitan government requires information, they are allowed to go into the local Census office. Our contribution is quite extensive but the payoff is that we're recording every request, the kind of information provided, and the actual result related to that information. So we're trying to learn more about how information is used.

We then started a series of seminars called GBF/DIME (Geographic Base Files and Dual Independent Map Encoding) Workshops, and we're trying to move more and more into simulated decision formats that allow people easy access to the information for decisionmaking. It's a very difficult task because you have to make it general in order that people can learn from it. On the other hand, if you get it too theoretical, you run into the same problem of having to go to school all over again to understand. It's a kind of balancing act which I think is evolving and we're getting more and more support now. The New Federalism has probably contributed more towards our ability to move our resources in this direction, because we can make the case that governments have to give people more than money to implement their ideas. This can be done by giving them the wherewithall to make better decisions, and showing how data can be used to monitor and evaluate.

Mr. Hanel: We've done something along this line which is called a User's Guide, which introduces the available information in easy stages. We tell the clients how to mark the maps, what to look for and what the benchmarks are.

The point is that our information package is just plain overwhelming to a lot of people when they first get it. Imagine all the paper—22 multipage reports and 300 maps. Somebody takes a look at that and says, "What do we do now?" The easiest thing to do is put it on the shelf and forget it. And yet, it's all useful reference and working material. We're trying to lick this problem. The simpler you can make the material the better, but the problem is it's hard to make things simple. We'd like to pare down our package, but the deleted portion turns out to be important information that somebody wants.

So we're always doing, as Mr. Barabba said, a balancing act. The real problem is that of publicity. What you're seeing now is our attempt to popularize this information program and get key people involved.

Mr. Barabba: In these seminars that I mentioned, we try to design a technical workshop where people, who would use the information as part of their daily routine, will actually experience the data files. We also have a 1-day presentation for their supervisors where we really put on all the bells and whistles. In a sense, what the Bureau is trying to do is to create a push and a pull through the entire system. It's a very difficult task. But every once in a while we are successful. We find somebody changed their way of doing things.

Mr. Hanel: I couldn't help smiling while Mr. Barabba was talking because, you see, he's giving information away, while I have to sell it—however modest the price!

Another important point is the interpretation of the data. Something which looks bad may actually be good. A loss of population is not necessarily bad. A concentration of female heads of house with kids is not necessarily negative, if they're moving into housing intended for them. You have to accommodate these people and the real question is whether the particular program is working the way you planned?

Let's finish up with our friends in Norfolk and look at the trend in some of the household characteristics. Households with children are down a couple of percentage points. Statistically it might not mean that much, except it seems to be an underlying trend in many central cities, and something the school people have to contend with. Meanwhile, the percentage of female heads of house with kids is increasing. That contrast is important, and calls for a look at geographic distribution and patterns.

In Norfolk, like many other older cities, there is definitely an upward trend in the percentage of retired heads of household in the central part of town. The number of jobless heads is fairly constant in Norfolk, which is a strong plus, particularly when you see that the small-area geography is also stable. One-person households are very definitely on the increase, something that you're going to spot in city after city. In Norfolk, there was little change in the high percentage of renters. This city really has

grabbed hold of things. The people understand their town, they are truly monitoring and managing it.

Let's get back to indicators. There's a lot of talk by scientists and statisticians about indicators. The disappointing thing, to me, is that some of those same people are going the farthest underground and away from the real world. They're hiding behind studies that conclude, "We don't dare talk about something bad because that will make the situation worse." I think we must make some fairly straightforward, easy-to-understand, shirt-sleeve use of these types of numbers, such as the rank order ratings. Let's experiment, test, and verify with sophisticated analysis as needed, but always keep the end result in a common denominator that people can easily understand.

There are all kinds of meaningful subjects that ought to be worked on. Cincinnati is looking at the relationships between some of these indicators and crime and fire. It turns out that there's some real coincidence between the rates of crime and fires and vacancies. This suggests that when you can find a single strong indicator, in this case, vacancies. Then you can earmark the places that deserve some special attention.

Student: In Los Angeles we have parts of this city where dwellings have been demolished. The people who were living there before. . .who knows where they're living now?

Mr. Hanel: To make a determination as to where the people went would require another step beyond where we've gone, but the resources are there to do it. You're asking if you do something that displaces someone, what happens to him and what is the rolling effect on others? Not by name, but certainly by numbers, we can see where these people went. You might find that the unemployment in some areas reworked through urban renewal is very low; in other cases it might be naturally high because of the presence of low-income housing.

We've seen some evidence in Norfolk of this sort of thing. They cleared out some substandard housing and the people who had lived there moved on. Now, there is evidence most of these folks didn't leave town. The next question is, specifically, where did these people move, and more important, what do they think about their new neighborhoods? How do you get at that one? You take the tape that says, "Here are our new movers. These are the people who have relocated within the last year." Pull out a list of movers with the characteristic you're concerned about and talk to them.

Mr. Barabba: Granted, we have some displacement. But, how do you find out if we're doing the right thing by those being displaced? Knocking on their doors might be considered an invasion of their privacy.

Student: Maybe. But, data acquired by knocking on the doors of those displaced people would allow, over some period of time, to make more sophisticated and valid appraisals of whether to redevelop an area, and what tertiary problems to expect when these people are displaced. To me, that is a legitimate social concern. This gets back to the point about the compromise between the individual's privacy and the value of the potential social indicator. In this instance, I think displacement is very definitely a social indicator that we are going to have to pay more attention to.

Student: In effect, you're coming to their door and saying, "We want to help you, and we want to learn how we can help you."

Mr. Barabba: I wanted to make this point that once in a while you have to make a tough decision as to whether you're willing to give up a little piece of your privacy.

These are the kinds of things you've got to address yourself to when you start looking at the information as a planner, or whatever you might be. What's the cost of getting that information? It's the cost of the information itself, and the cost to society of having somebody knock on its doors.

Mr. Hanel: Do you remember in Midtown there was an area where formal vacancies were increasing at the same time doubling up was increasing, and the net result was more households rather than less? The whole thing was unplanned, and there was a big shift in demography.

It's one thing to have a planned development. It's another to have a situation like Midtown's which just sort of happened, and if you recall, it happened very suddenly. There was no significant physical deterioration in that neighborhood, to speak of; it was far more perceptual than physical. Different types of people were moving in and they're coming in from somewhere, yet, nobody quite knows where. Unless the people in Midtown can deal with that, unless they can understand it, unless they can encompass it in their planning and their thinking, that could easily become a very difficult situation in that part of town.

What I submit is that in this kind of a situation, if you don't understand these things, how in the world are you going to deal with them? The compromise may very well be that you have to know certain things, and the decisionmakers can profit from hearing what the people have to say, if you can get them to talk.

Student: Could you comment on the changes of housing types that we've had in the last 5 years? The move toward mobile homes, condominiums, etc. How has that affected the breakdown of housing?

Mr. Hanel: There is continuing and increasing pressure on low-cost housing. While your housing stock may not be changing, the number of households, the people who are competing for available housing, is increasing. You have the pressure toward more household units on one side and a lid on availability, mainly because of money and cost, on the other. I think there's going to be one dickens of a squeeze on central city housing stock. The flight to the suburbs, in the light of the energy situation, is not the long-range answer.

Student: Does the size of the city affect the reliability of what you can do?

Mr. Hanel: No. The biggest one we've done is Houston and that's 1.25 million people. The smallest is around 12,000 people. Size hasn't seemed to influence the reliability of the data.

Student: Why haven't you done Los Angeles?

Mr. Hanel: You can't make ends meet publishing a city directory in Los Angeles.

Mr. Barabba: We pointed out that the production cost of this type of data may remain stable, or relatively stable, over time. It

could go up a little bit or it could go down a little bit. One of the things that keeps this price down is its use for other purposes. In the case of the R. L. Polk Company, they sell the lists.

Mr. Hanel: An important correction regarding privacy; we don't sell lists, and certainly we don't sell the records from which particular lists are selected. We list from the files those addresses at which we find the conditions or characteristics of interest to a particular marketer, and we use that list for him under a one-time rental arrangement. In most cases, the list never leaves our premises.

We never search the files for the names and addresses of individuals except when the individual has requested his record be deleted from the file.

In any event, with only one exception, we never let the basic information out of our hands. That exception is to supply some city governments information as backup to the kinds of statistics we're talking about today. Some cities want to do subsampling, for example, among new movers or vacant housing units. Or they want to put the numbers together for different kinds of geography than tracts—for the length of a street, for example. When we make address-by-address detail available, it's under an agreement that the city will strictly control the use of the file under its normal confidentiality restrictions.

Ironically, everything in our files is either from a public record or represents the objective, nonsensitive, public face of the individual. The real question in this whole business of lists and directories and similar data is "What's private and what's public?" It seems to me a gross extension of privacy to cover every aspect of a person's identity, including those that can readily be observed. As Mr. Barabba has said, being a member of society implies being counted, and it also requires being identified for various public and business purposes.

Mr. Barabba: You can also buy a directory of the people of that city, published in a book, and that has what information in it?

Mr. Hanel: Everything we've talked about, except the number of children. We don't publish that.

Student: The Census Bureau represents a public agency that is policed by the Congress. R. L. Polk is a private agency, and there doesn't seem to be anyone directly policing your standards of confidentiality.

Mr. Hanel: It's important to bring out the fact that we publish around 1,200 directories which include 7,000 communities, and you can go back in time. Some of these have been published for 20, 30, 50, 70, and even 80 years. Also, there's nothing in those books today that wasn't in them 10, 20, or 30 years ago. Not only is the information the same, the procedure, with one exception, has not changed either. However, it's that exception, the use of computer processing, that needlessly scares everyone. The computer doesn't make any difference in the content of the directory.

Besides, I don't see any information we gather that could be misused. As I said, we publish all the information we collect, except the number of children in the family.

We go door-to-door with a carefully controlled survey. We go, into each city each year almost on the same schedule. In a city of 100,000 people it might take us 2 or 3 months to make the canvass. The supervisory crew moves in, and they usually are the same people who have been dealing with the city for years. The interviewers are local people, usually neighborhood people—housewives, retired people, and students in the summertime.

The canvassers are armed with a print out of the information which appeared in the previous year's directory. It shows street name and the list of all the addresses on that street, such as, "105 Main Street is Smith, Jim. Wife's name Mary, etc." Their job is to verify, update, and correct as necessary the record which appeared in the previous year's directory. Actually, there is a change of some kind in about 60 to 80 percent of the records. They bring those work sheets in and we keypunch the changes. Those corrections are fed into the computer, and that becomes the data base for printing the next directory.

People ask us how we make sure that the interviewers don't spend their time in the bar, or the drug store, or home reading, or something. First of all, the supervisors call some respondents and ask if the interviewer was courteous. Also, the computer is programmed intentionally to insert a bit of nonexistent information in about 1 in every 20 records, randomly, like the name of someone who isn't there. The interviewer's work is checked to see whether they have verified any of these false records. It's very effective self-policing.

Mind you, one of the most important ways that the accuracy of the information is policed is the fact that it is published. It is there for people to use, read, and look up. Our directories couldn't have lasted all these years if they hadn't stood up under this kind of scrutiny.

Student: One of the hardest things for me to accept is the fact that you're listing me in the directory.

Mr. Hanel: You might be interested to know we have not seen, over the last several years, any appreciable change in the number of people who ask not to be listed in the directory. You may note in one of the tables in our reports, we show the number of occupied households, the number from which we get interviews, and the number where we get name only, or that ask us not to show anything. And that runs only about 2 percent of the total—a very small amount.

Student: Are the people given the alternative not to be listed?

Mr. Hanel: Oh, sure.

The question that you raise keeps coming up: "Do we adequately inform the people of what we're doing?" Our answer has stood up well, and that is, we do. That doesn't mean they listen every time, and certainly we can't take out 5 minutes to explain all the possible uses of the information, but there's no attempt and no suggestion of any attempt to hide or in any sense disguise the purpose of this solicitation.

Student: Have you ever had legal hassles?

Mr. Hanel: I remember a case about 3 weeks ago where a doctor had asked not to be listed and somehow he was. He wrote us a letter threatening to sue. If someone asks not to be listed in the book, we comply. If there is any of that kind of problem, like the doctor's, it's because of a slip-up that occasionally happens. But, it's certainly not a matter of intent or neglect. One year the whole police force of a certain city asked to be left out of the directory, and we complied.

Student: I, myself, have never been contacted by anyone for a city directory, yet I have found myself listed in city directories and I wonder where they got the information.

Mr. Hanel: Sometimes we get name lists from employers in the case of public services.

Student: You see, I was never given the opportunity to refuse, and I resent that. I wouldn't mind giving the information, really, from the statistical standpoint. I just wouldn't want my name to be published in any book.

Mr. Barabba: Will you accept the information and not publish it? Is there an option that way?

Mr. Hanel: If we had the record it would be there. If you asked not to be in the directory, we would obliterate your record.

Mr. Barabba: But you wouldn't carry his data forward?

Mr. Hanel: No. He would become what we call a "no return" at that street address.

Student: Would it be necessary to interview him the next time?

Mr. Hanel: We wouldn't know that we were coming to him. We would have his address with a "no return." They'd knock on that door again and he would say, "Well, last year I asked not to be listed." The interviewer would know immediately at that point. Now, if someone had since moved in at that place, they might volunteer the information.

I think most of you would agree that year-to-year information is an important dimension in understanding what is going on in our cities. If it is, there's only one way to get it. And it is not through the Bureau of the Census because the budget people have said that the Nation can't afford a mid-decade census, much less an annual census. The kinds of statistics that we're talking about in understanding the dynamics of a city can only come as a low-cost byproduct of an ongoing enterprise.

We started this venture about 1968 because we were aware we possessed what amounted to an annual census, although we were simply tabulating inventories. In 1971 we started working in the dimension of the detailed components of change.

There are many things that such information might be used for. If you want the answers to problems associated with the energy crisis, employment, business opportunities, or the whole city-suburban problem, then determine the sources of employment and residence.

Until people running cities learn how to understand and deal with year-to-year small area change, they'll be reacting to existing problems rather than anticipating and managing problems before they arise.

You talk about trade-offs. If you consider that this is valuable information, you must accept that there is no way to obtain it at these costs, except to do precisely what we're doing.

Mr. Barabba: Let's assume a congressman introduces a bill that requires any organization with individuals in a computer file to apprise those individuals that they are in the file, what is on the file, and that they be notified everytime that file is used. So you have a hearing and everybody tells you about how good it is to protect the individual. Mr. Hanel comes in and says, "Well, instead of now being able to give you all this information for 15 cents, it's going to cost you $1.50." It's also going to cost 10 times more to get a mailing list to communicate for marketing purposes, it's going to cost 10 times more to get at this kind of information relative to community analysis.

Student: Is such a bill actually pending in Congress?

Mr. Barabba: Yes.[1]

Student: Originally we talked about using the information for a purpose that was not intended when the information was given. Our information here is going to be published. If somebody buys the book and uses it for an entirely different purpose, that's O.K. Anybody can buy the book, and people knew they were giving information to be published.

I think that it might be appropriate, if I allow my name to be used, that Mr. Hanel have a signed release from me, and on the release it would explain where my information was going.

Mr. Hanel: You've just blown us out of the water cost-wise because you start to do that and we are into a 5-minute conversation.

Student: Probably, but you indicated that there may be as much as a 25-percent turnover in some cities. So, that release could be a continuing thing until a letter was written to you to delete that information.

Mr. Hanel: That means filing and handling 27 million letters. Not to mention the cost of originally getting the letters or signed forms. We once asked a question on the ages of children as an experiment when some city wanted that. People are used to furnishing certain information for the city directory, and they say, "Why are you asking that for the first time this year?" It doubles or triples the interview time and cost right there.

Student: I agree that it has a price, but most people every year have to file an income tax return. It would seem to me that people could also file some type of statistical data every year, that wouldn't be used by name, so they could come up with different information.

Mr. Barabba: We call that a census, only we do it every 10 years.

Student: But the income tax thing is all done by mail. The people do it, and why couldn't they do the other?

Mr. Barabba: Because, it would cost over $300 million per year to receive, process, tabulate, and evaluate all the citizens.

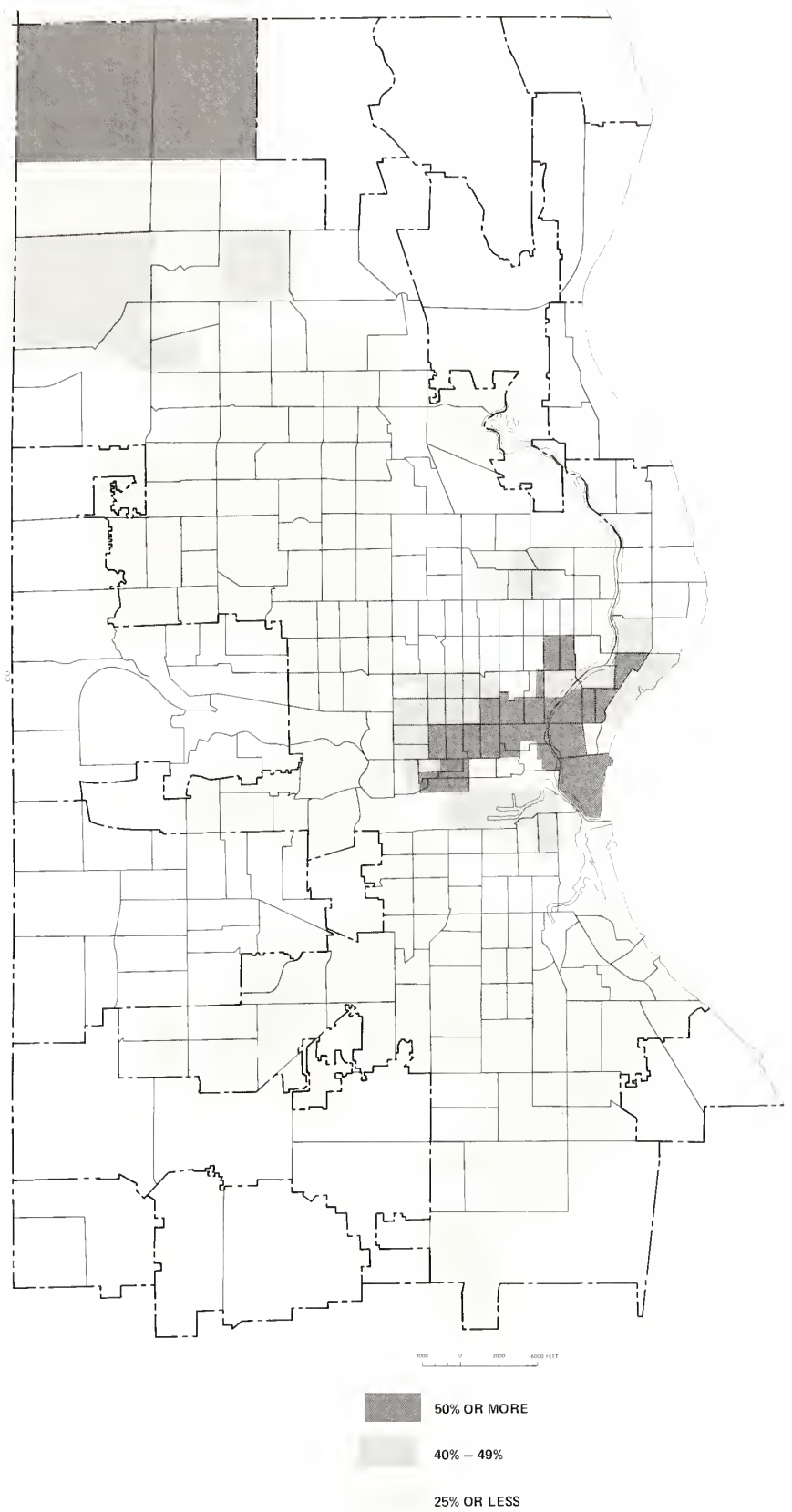
Well, let's assume you are congresspersons, what do you think? Do we ask Mr. Hanel to change the way he does things?

Student: I don't think it's an invasion of privacy just to make a list of people's names. If that list were mandatory then it might be an invasion of privacy. Otherwise, it's strictly a voluntary thing, I can't see where it's any invasion of privacy and I'm sure if anybody wants to find out who lives in such-and-such a household, he can find out anyhow. So you might as well make it easy for him and give him all the statistics.

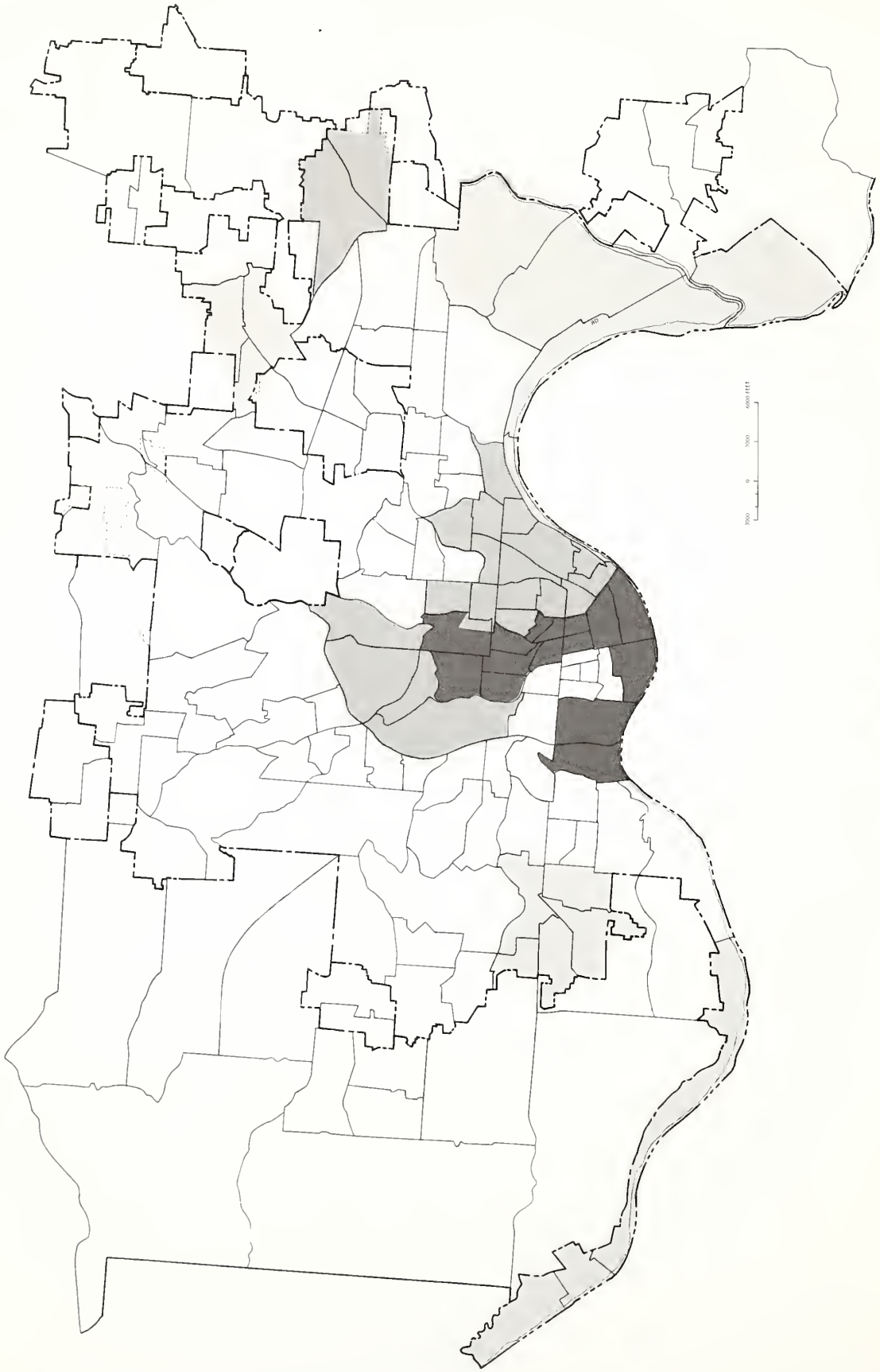
---

[1] Privacy legislation regulating Federal activities was enacted December 31, 1974—Public Law 93-579, Section 3418.

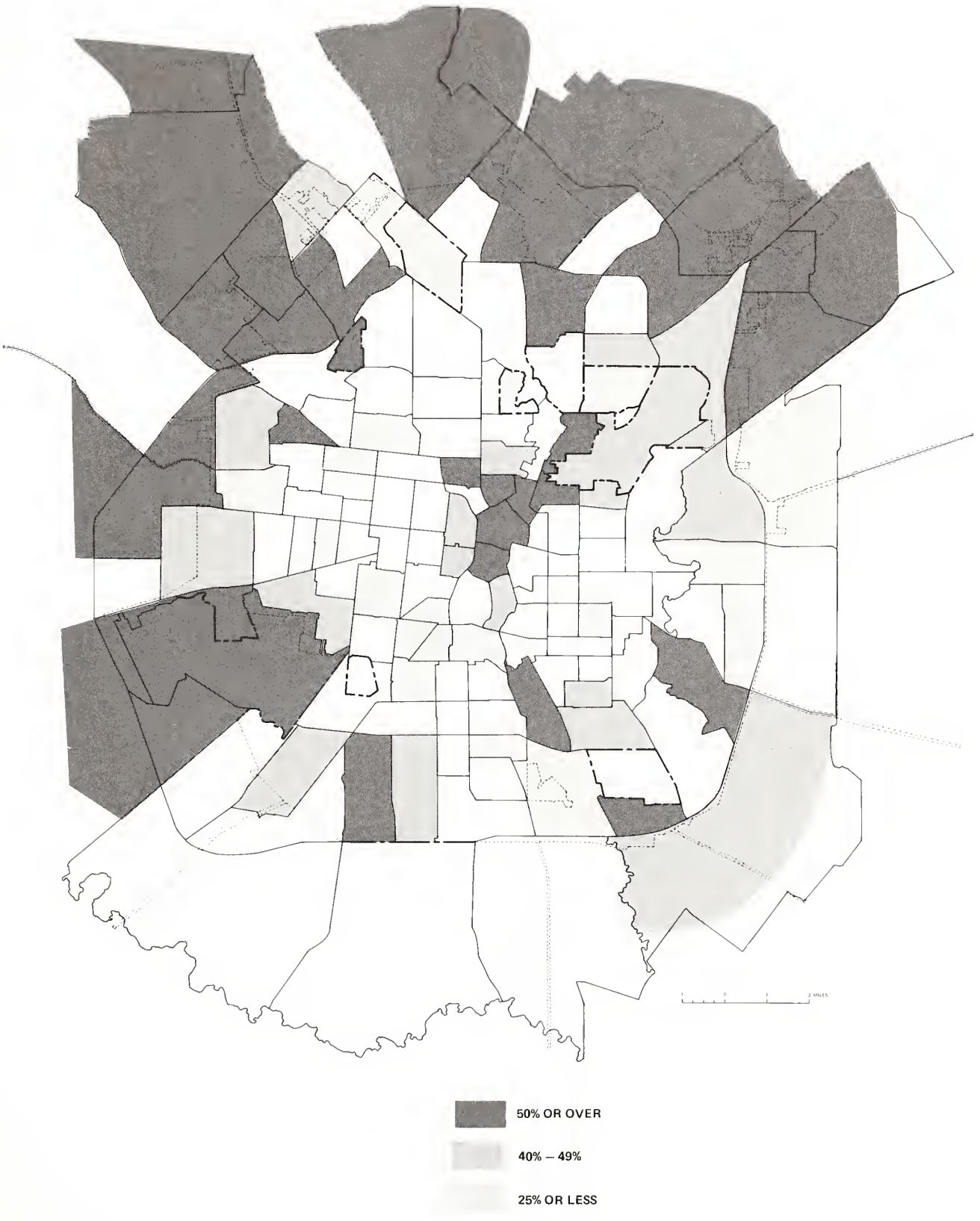
MAP 1. MILWAUKEE, WISCONSIN
PERCENT OF OCCUPIED HOUSING UNITS
WITH CHANGE OF FAMILY
27.35



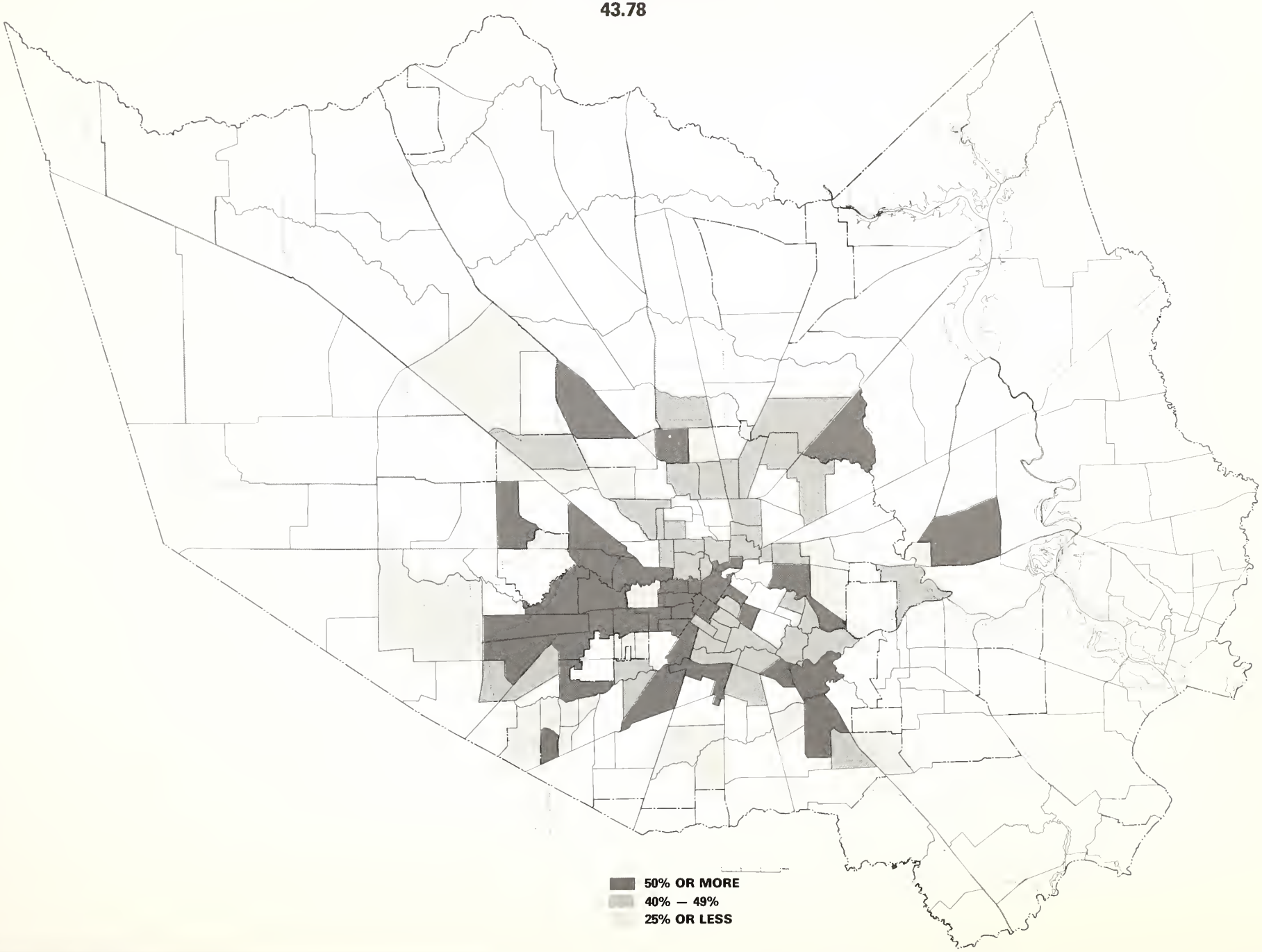
MAP 2. CINCINNATI, OHIO
PERCENT OF OCCUPIED HOUSING UNITS WITH CHANGE OF FAMILY
36.36



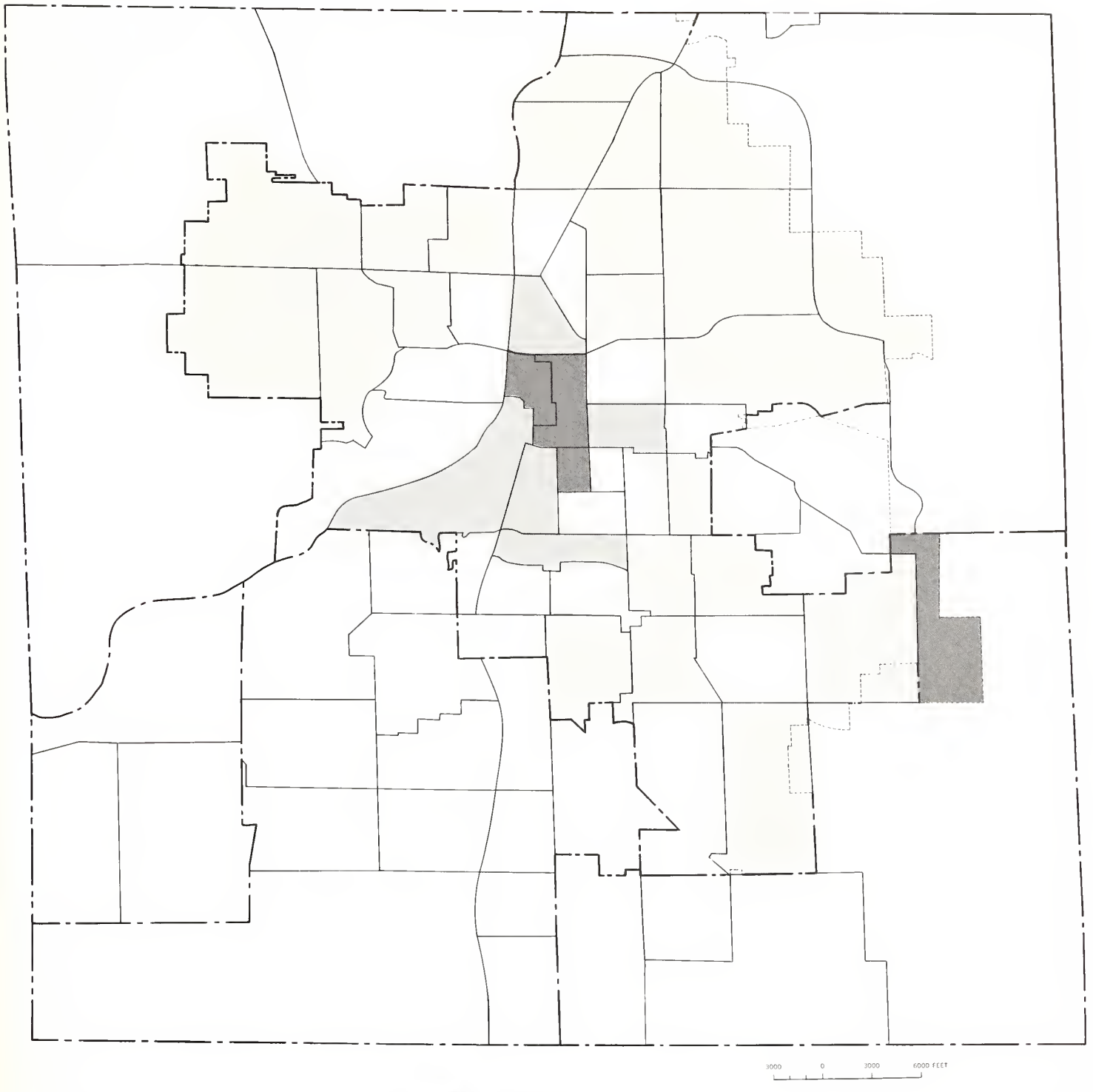
MAP 3. SAN ANTONIO, TEXAS
PERCENT OF OCCUPIED HOUSING UNITS WITH CHANGE OF FAMILY
36.78



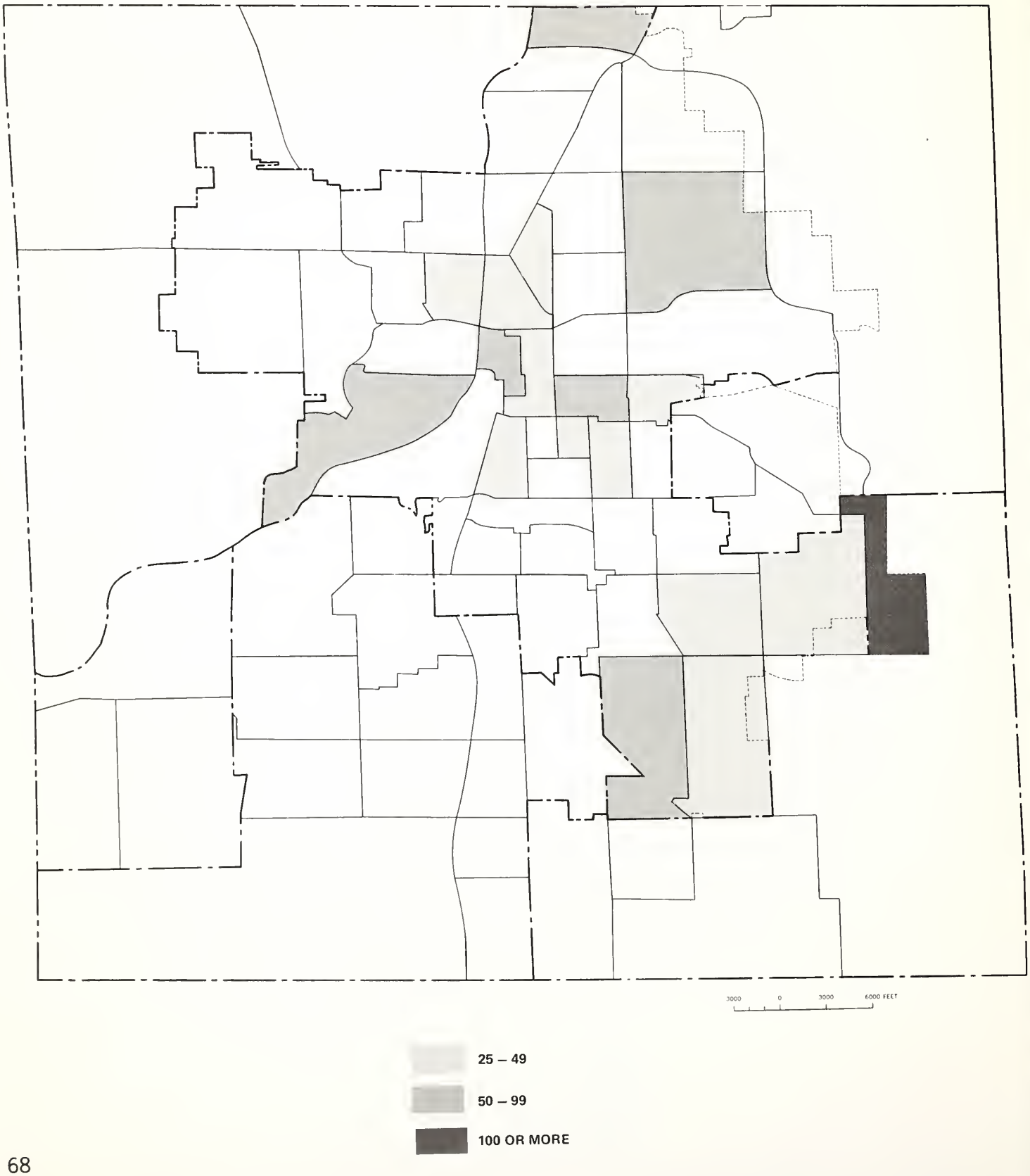
MAP 4. HOUSTON, TEXAS
PERCENT OF OCCUPIED HOUSING UNITS
WITH CHANGE OF FAMILY
43.78



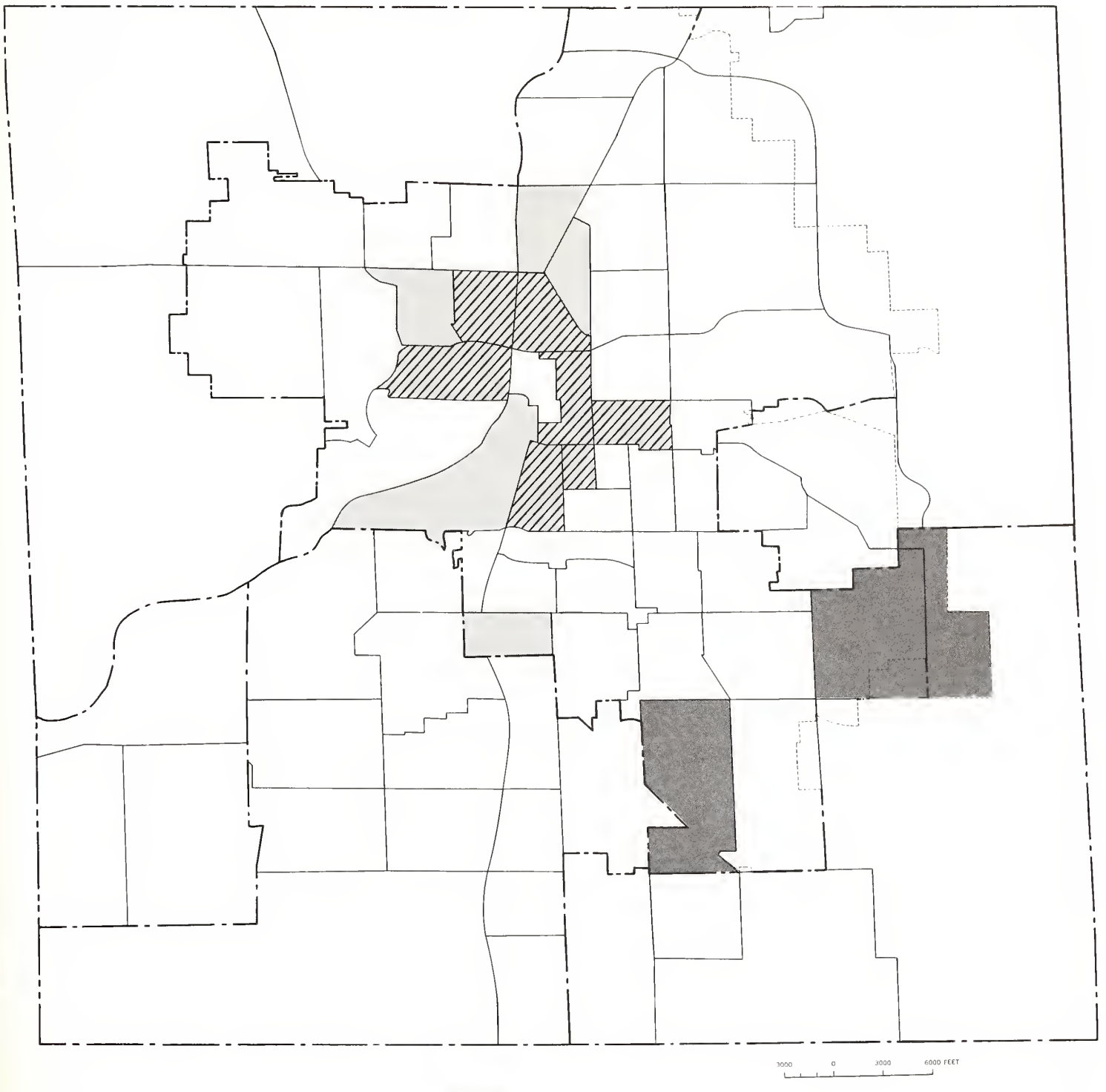
MAP 5. PERCENT OF OCCUPIED HOUSING UNITS WITH CHANGE OF FAMILY
27.70



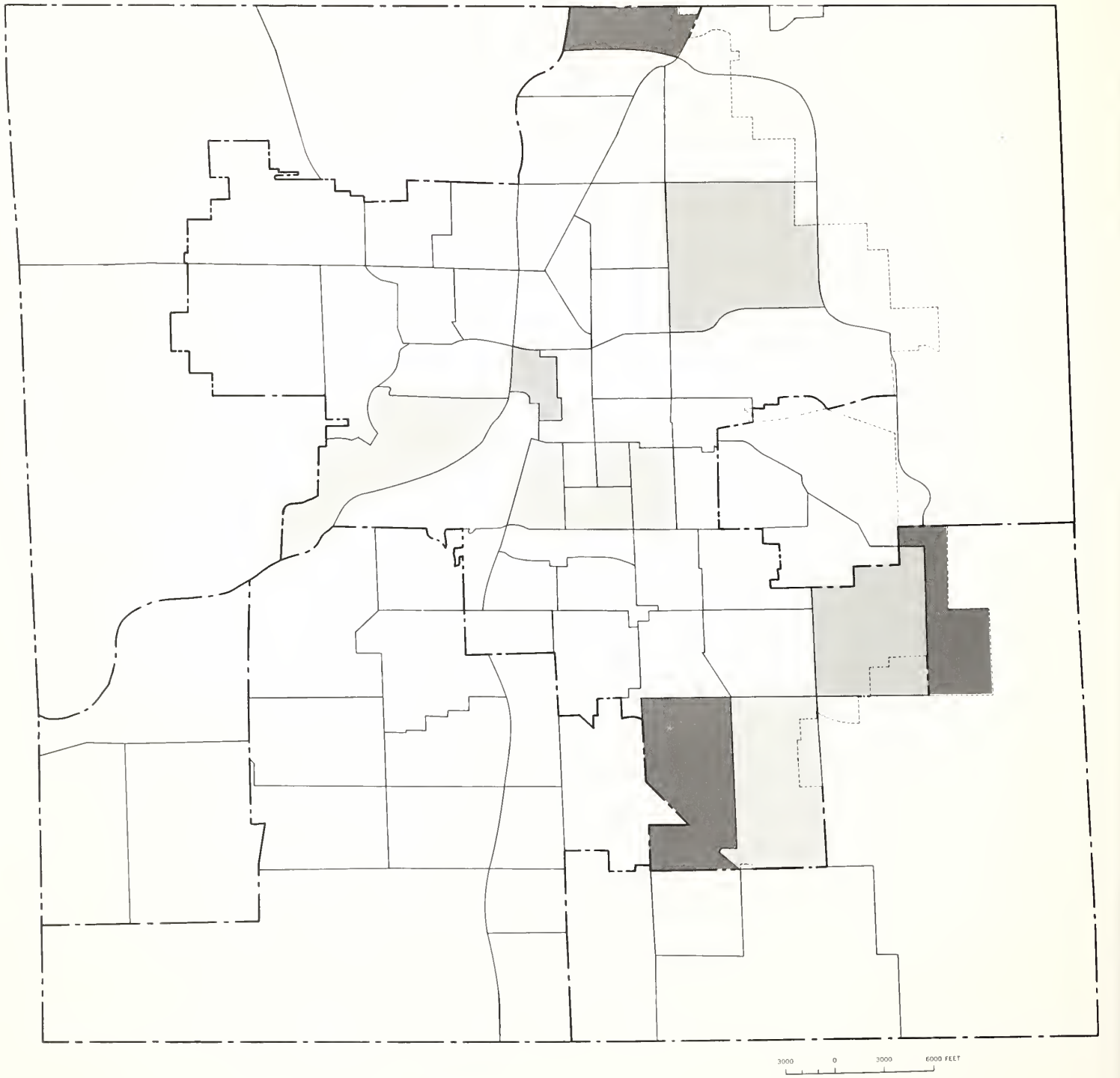
MAP 6. NET CHANGE IN TOTAL HOUSING UNITS
1,216



MAP 7. NET CHANGE IN VACANCIES
CHANGE IN OCCUPANCY OF EXISTING UNITS
+ 437

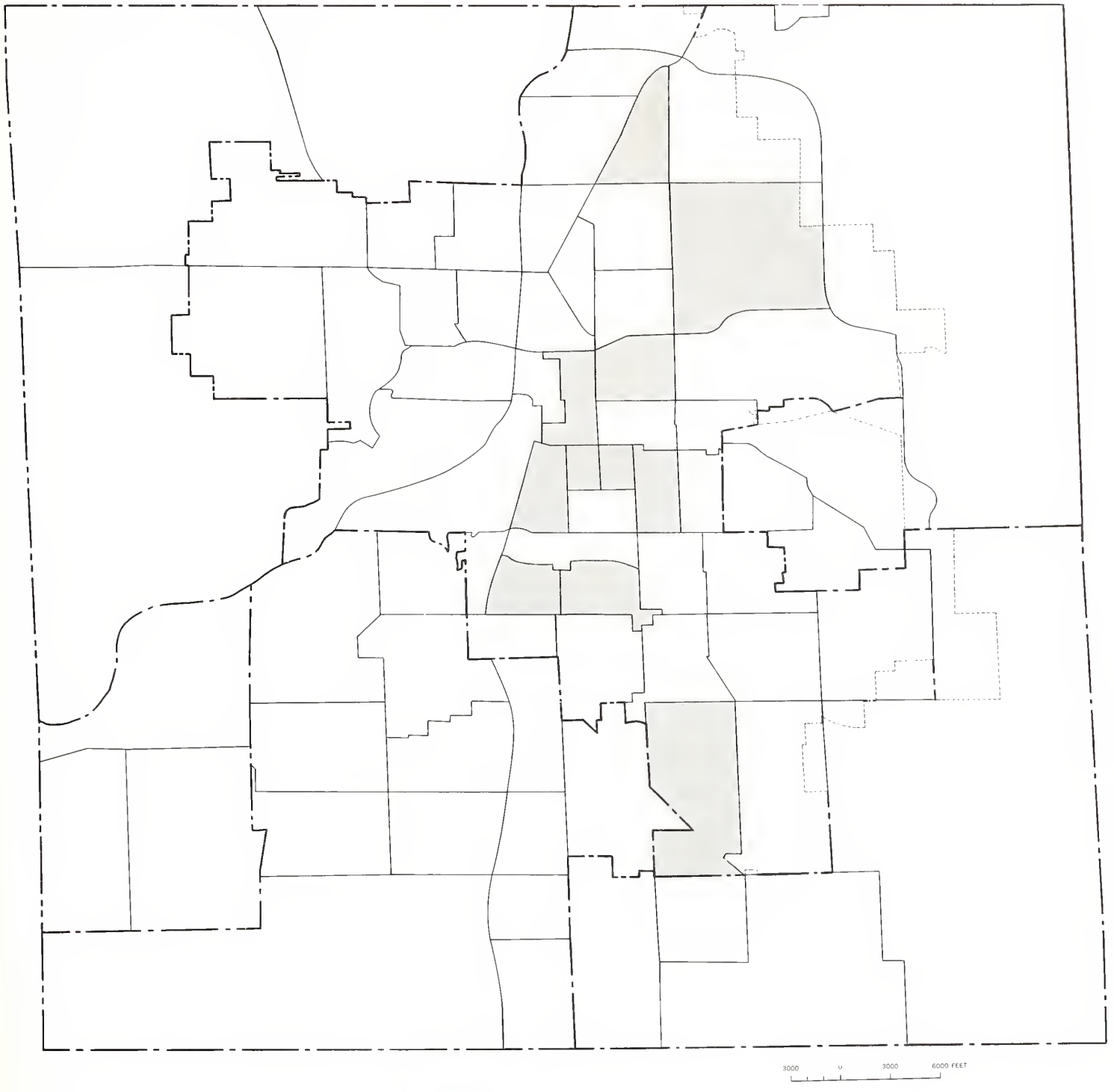


MAP 8. NET CHANGE IN HOUSEHOLDS
+ 788

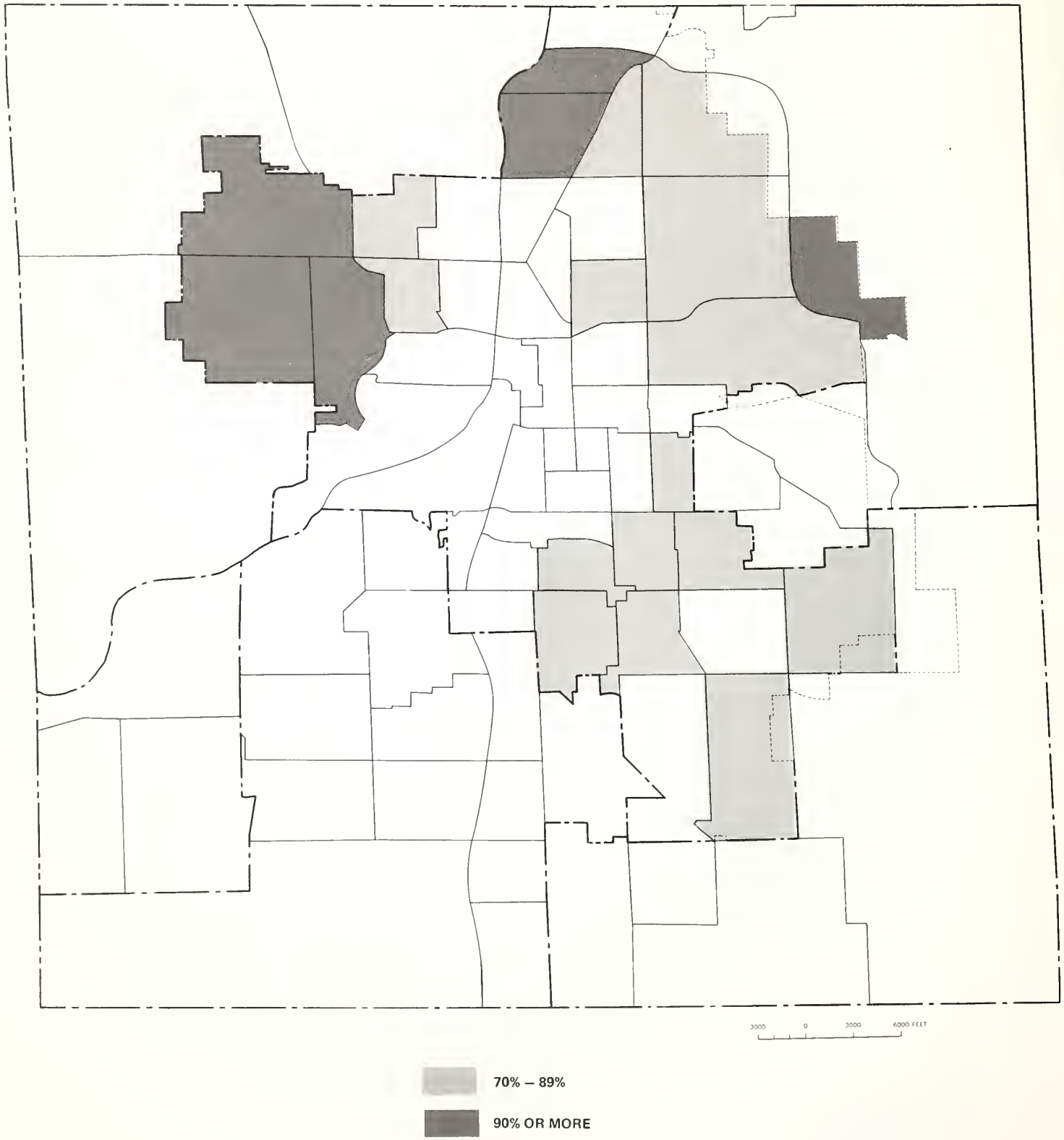


MAP 9. NET CHANGE IN JOBLESS HEADS OF HOUSEHOLD (EXCLUDING RETIRED & STUDENTS)

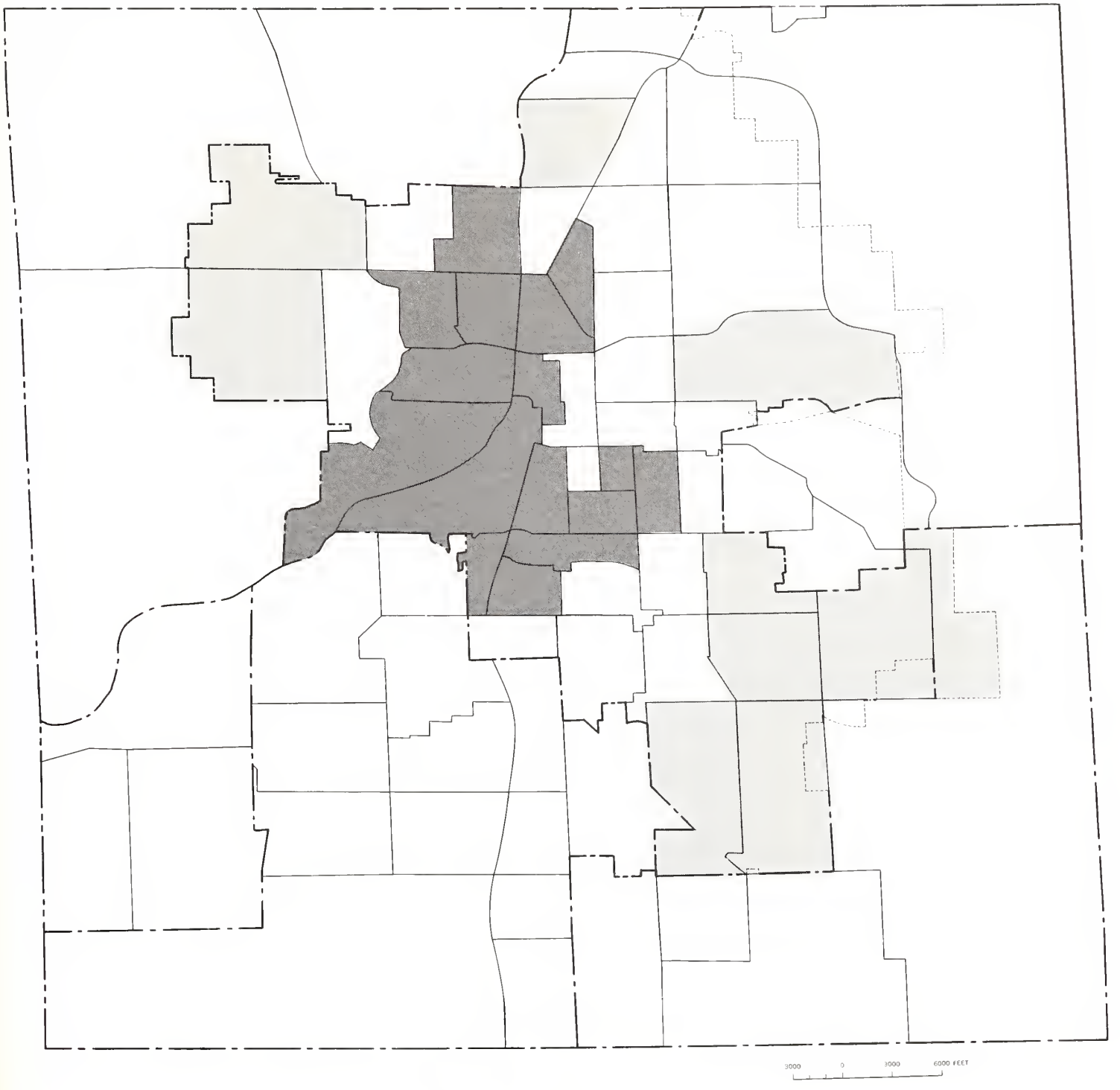
+702



MAP 10. PERCENT HOMEOWNERS
66.62

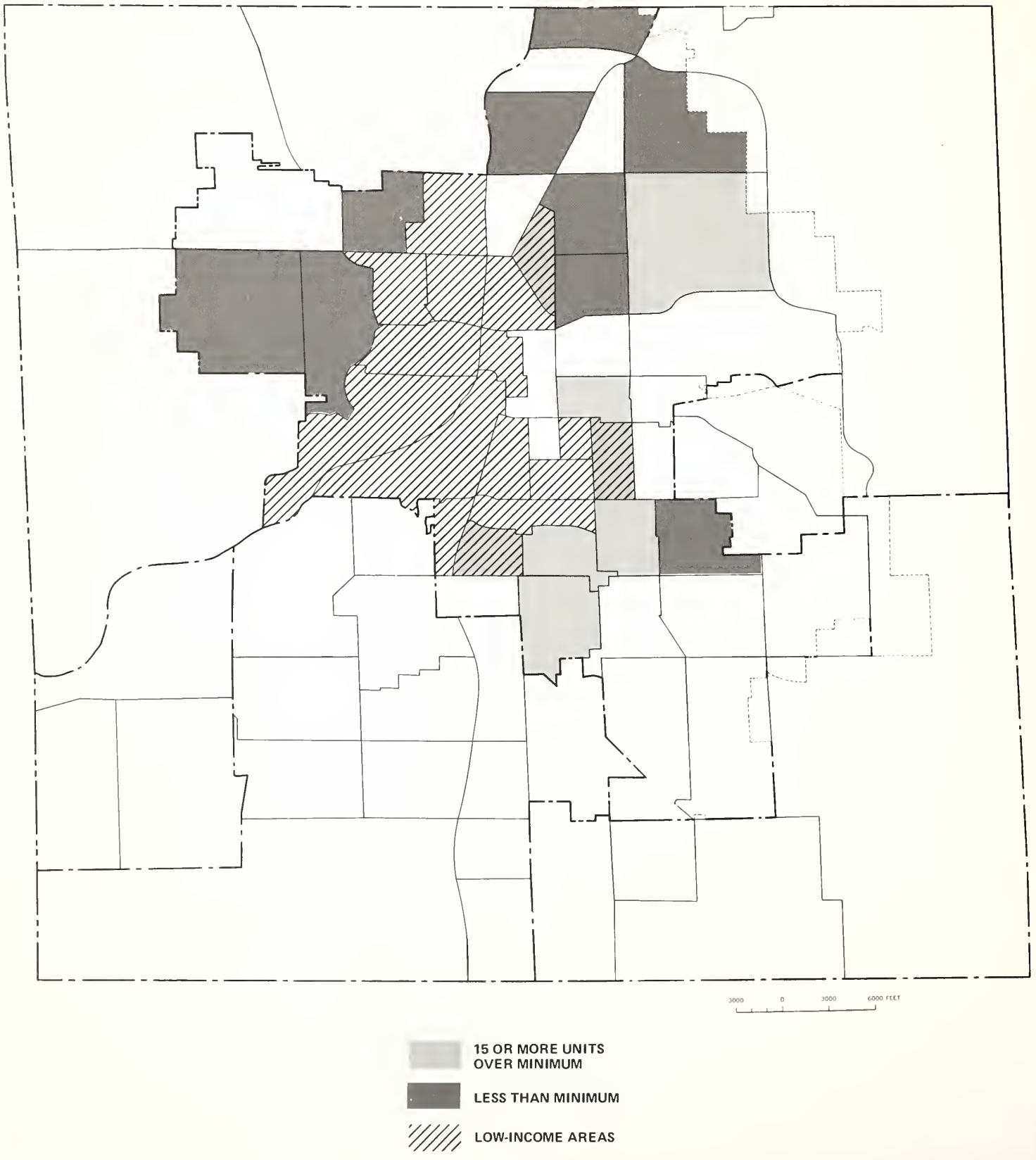


MAP 11. HOUSEHOLD INCOME
AVERAGE INDEX POINTS
102

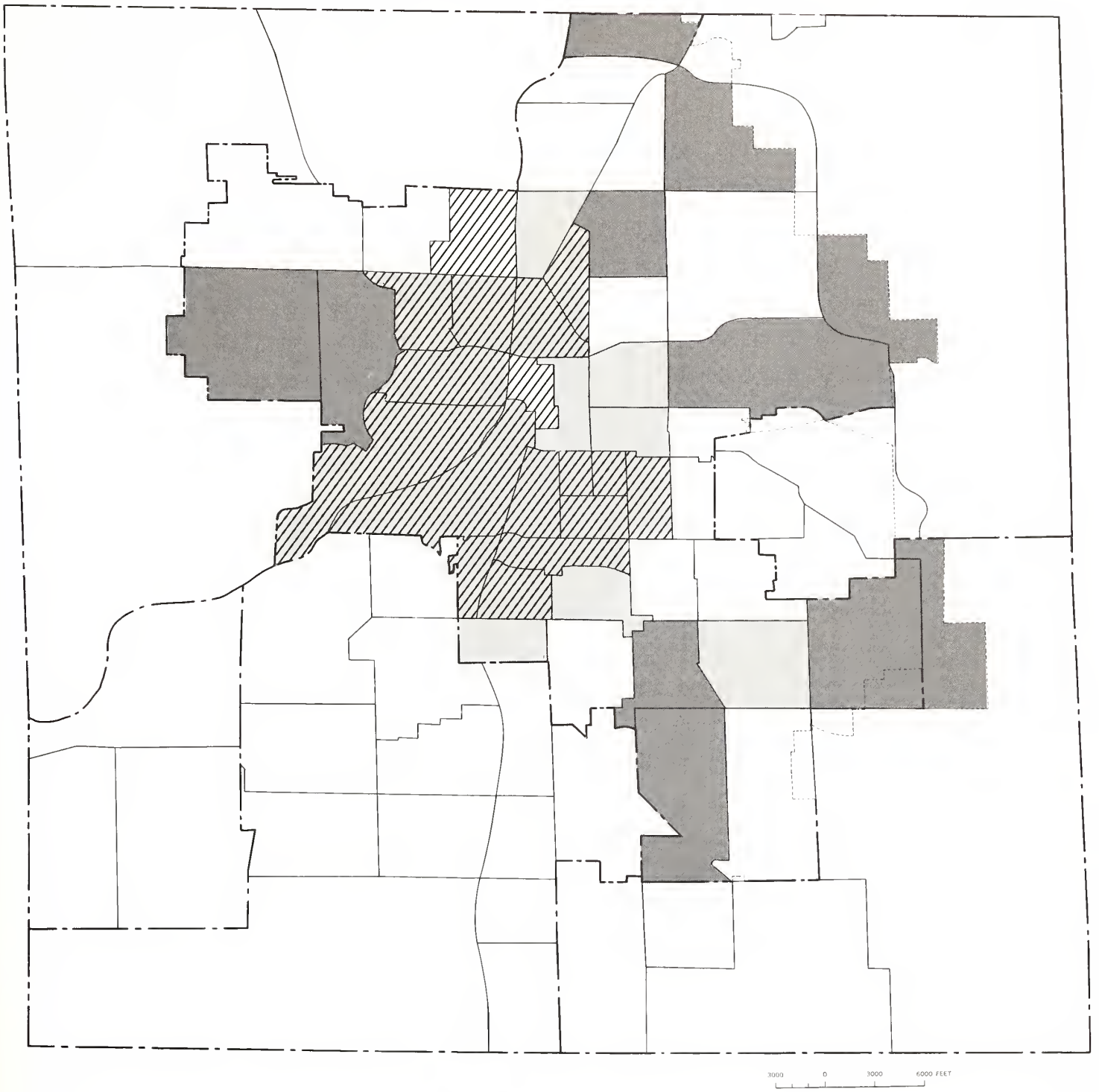


MAP 12. NUMBER OF CURRENT-YEAR VACANCIES FOR SALE OVER/(UNDER) MINIMUM REQUIREMENTS

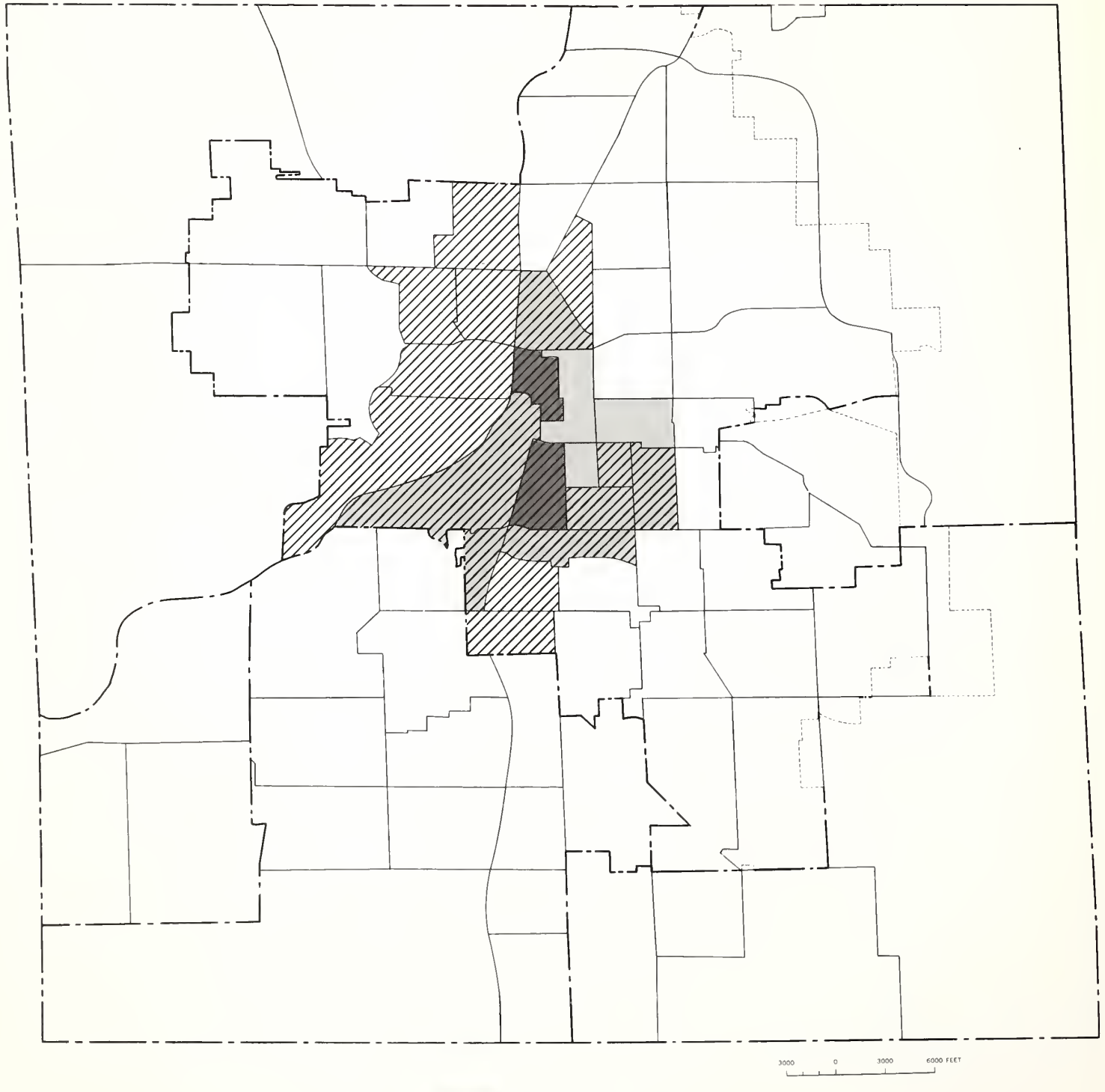
299



MAP 13. NUMBER OF CURRENT-YEAR VACANCIES FOR RENT OVER/(UNDER) MINIMUM REQUIREMENTS
809



MAP 14. PERCENT OF HOUSING UNITS VACANT
6.86



THE ROLE OF PRIVATE FIRMS IN DEVELOPING INDICATORS

Richard Wirthlin, President, Decision Making Information, Santa Ana, California

"If we had simply taken the aggregate data we would have been more than half blind. When you begin separating the data by city, only then does it have significance in terms of a public administrative action that makes sense for residents of Compton, Paramount, Lynwood, Bellflower, and Downey."

Richard Wirthlin

Mr. Barabba: I'd like to introduce Dr. Richard Wirthlin of Decision Making Information, a national survey research firm. Dr. Wirthlin's academic background is in the area of economics, and he has been chairman of that department at Brigham Young University. Prior to helping form Decision Making Information (DMI), he headed another firm, Merrill/Wirthlin and Associates, which was strictly a survey research operation. DMI was formed when Merrill/Wirthlin merged with Datamatics, Inc., an organization basically involved in the computerization and analysis of secondary data. Dr. Wirthlin intends to discuss the type of assistance that such a private firm can provide decisionmakers as well as the techniques used to accomplish the survey research.

Mr. Wirthlin: It's a great pleasure to be with you and to share a session with my good friend, Mr. Barabba.

The general topic of this entire series is, I think, extremely timely—developing social indicators to cope with "future shock." Kenneth Boulding, an economist, has said, "We live in a firestorm of change." This day, August 9th, has brought a dramatic example of how rapidly political change can occur. A new president assumes office, it seems, almost overnight.

Someone, I think it was the German philosopher Goethe, once said, "What is not understood is not controlled." We can paraphrase and say, "What is not understood cannot be administered well." If there is an ultimate social objective to gathering and processing either primary or secondary data for public administrators, it is, I believe, to understand the forces that shape and mold society, so that we can better administer and serve those people affected by societal changes.

I would like to address myself to what a private research firm can do for you by detailing some of our activities at Decision Making Information.

But, first, let's briefly identify the major advantages of working with survey research data (as opposed to secondary data), discuss its logic and analysis, and demonstrate how it relates to, and can strengthen, secondary data.

The analytic strengths of survey research data are first, inasmuch as you need not interview all individuals, the data are timely—a survey can generate data within days and, in some cases, within hours. Second, topically, survey data can be as focused or as diffused as desired. One might say it provides the public administrator with a zoom lens. He can pull back and view an entire city on an aggregate level, or he can zero in on a particular subgroup within the community, sampling from it to determine the specific and analytically critical characteristics of that subgroup.

For instance, the number of female heads of households who have moved within the last year could constitute a universe, which is simply a collection of individuals who have a specific characteristic. From that universe we select a random sample which generates the information of interest. The basis of all survey research is proper sampling of a carefully identified universe.

Third, survey research provides us with an understanding of the nature and strength of relationships not obvious or even discernible when we use aggregative or cumulative data. This afternoon I'd like to overview the nature and application of survey research.

About the assigned readings, the Office of Management and Budget book, **Social Indicators, 1973** edited by Raymond A. Bauer, should provide some historical perspective of social indicators as generated and evaluated by survey sampling. The analytic mode of survey research data is reviewed in **The Logic of Survey Analysis** by Morris Rosenberg.[1]

Let's now review the logic and implementation of survey analysis. As I said earlier, one great advantage of doing primary research lies in the fact that you can select the specific building blocks of the analysis. You are not restricted to looking at only, say, income, occupation, or vacancy rates. You can develop a wide array of variables and use them to test a given hypothesis about society. Even more important, survey research enables the researcher to go beyond the standard descriptive variables. It is critical for classification purposes to deal with demographic variables such as age, number of children, education, etc. If we designate age as the first demographic variable of interest D_1, and the number of children as D_2, then there is a large but finite number of demographic variables, the last of which we'll call Dn. Thus we may select for analytic purposes any of the D_1, D_2, . . . Dn variables. However, in most survey research packages we also deal with certain economic variables such as occupation and income. Again there would be an "n" number of these economic variables that we would want to consider; these can be designated as E_1, E_2, . . . En.

We may deal with certain political variables such as political alienation, efficacy, apathy, cynicism, the attitude the respondent may have about a given bond issue, or his propensity to vote. These variables may be identified as P_1, P_2, . . . Pn. Thus, there's an "n" dimension of political variables we can generate and use in our survey analysis. Possible territorial or ecological variables T_1, T_2, . . . Tn may be of interest. There are also more general attitude variables that we may want to crank into our initial hypotheses such as attitude toward work, status, self, etc. (A_1, A_2, . . . An). In other words, we can deal with an almost infinite number of dimensions for the purpose of analysis when we begin

[1] Morris Rosenberg, **The Logic of Survey Analysis,** Basic Books, Inc. New York, 1968.

constructing the questionnaire or, as we call it, interview schedule.

There are some constraints once you determine the hypothesis. The first and most fixed constraint on the number of information pieces you can gather in any one interview is the amount of time available for the interview itself. Generally, we can interview a respondent for about an hour at any one sitting. Sometimes the interview can last as long as an hour and a half. But, as a rule of thumb, we find that response error and the number of nonresponses are kept pretty well in line if we keep the interview to 60 minutes or less.

Student: Our instructor has shown us a graph apparently indicating that, if you can get a couple of variables that will give you more information, you're just as well off when you're using a few rather than using a large number in the analysis. Do you find that with more variables you can do a better job with the analysis or does it hold that with the fewer variables and a more brief interview you can come up with the same answer?

Mr. Wirthlin: Clearly, the study will cost less if the survey generates only variables that statistically are highly explanatory. The major limitations in identifying these particular variables lie in the fact that frequently, unless we simply replicate someone else's study, we don't know beforehand what these explanatory variables might be.

Student: Do you add more variables just in case somebody challenges you later on, so you can be defensive and say, "We have examined these other parameters?"

Mr. Wirthlin: I prefer to view the value of having more variables available for analysis not in terms of being defensive, but rather having a margin of analytic safety. The strength and flexibility of survey research lie in the wide range of possible variables. We can create the variables that we think, *a priori,* are important to the problem with which we're dealing, be it crime, health statistics, mobility, or identifying an agenda for change in a community.

Student: Do you prefer, from your own experience, a few or a lot of questions?

Mr. Wirthlin: If you and I lived in a world of unlimited resources, then clearly I would prefer "a lot." But we don't. Further, the number of variables used in the analysis depends on the complexity of the task. In some cases, we can get all the information we need and more in a matter of 5 minutes. In other cases, it might take us several hour and a half sessions to ferret out the variables of potential importance. Toward the end of our session today I'm going to talk about a study that we did, Measuring Outcomes of Manpower Programs. Virtually every one of the variable dimensions that I've listed, demographic, economic, political and attitudinal, were used in that study because "outcomes" could not be measured simplistically and dimensionally in terms of the training experience alone. Individuals who went through training had vastly different experiences both before and after their training. Now, you have to control—and we'll get into this when we talk about the analysis of survey research—a broad series of test variables. Age determined, for instance, the potential employability of an individual. Education surely did. Attitude variables also influenced outcomes. Therefore, we had to look at a very broad spectrum of possible employment-determining elements that might affect an individual's work experience.

Student: When you plan the interview, do you have some distractive variables to put the respondent at ease so you get better information from him?

Mr. Wirthlin: Generally, we initially ask something that invites a quick and painless response. One interview we're using right now in Orange County is designed to identify travel patterns to assist the county transit district in setting up its vehicle scheme efficiently. That interview begins this way:

> Hello, I'm so-and-so of Decision Making Information, a national research organization. We're conducting a survey in your neighborhood today concerning public transit in Orange County. Do you have a current driver's license?

And with that, we're right into the interview. If the person responds to that first question, almost always he will complete the interview.

There's a great deal of art in this so-called science of survey research—properly pacing the interview, using visual aids to keep attention and interest high, employing a variety of questioning techniques. These are all methods employed to get high response rates.

The other constraining factor on our "unlimited" array of variables lies in the accuracy of responses to the questions. There are certain response errors which clearly limit the scope of the data that can be acquired through the survey method. For instance, if you asked a person whether he was registered to vote in the 1972 election, and, if so, did he vote, you'll find that most people, because they feel it's a social imperative kind of thing, will say they voted, when, in point of fact, they didn't. For instance, in national post-election studies conducted in November 1972, about 82 percent of those polled said they had voted, while the national statistic is actually around 60 percent for voter turnout. So you must be very much aware of the limitations inherently imposed by this method of data collection when you initially establish your array of analytic variables.

The Logic of Analysis

Now, what is the logic of survey analysis? We have a limited number of possible factors. Once the data is gathered, we then try to identify those variables that are associated with each other. We can't identify causations, but, by introducing a test variable such as age or attitude, we can ferret out the strength of the particular relationships we are interested in between the training experience and change in income, exclusive of age or attitude.

Hence, the entire analysis and, thus, the structure and scope of the questionnaire are conditioned by your hypothesis about the relationship between two or more variables. On this base, you develop your interview schedule or questionnaire. Some questions are closed-ended, responses for which are limited and predetermined. For example, "Do you have a drivers license?" (yes or no) or "Will you vote for candidate A or B in the election for Senator?" (A, B, or undecided). Other questions are open-ended, or have no preset responses and no limits. For example, "What do you consider to be the most important problem facing your city today?"

One type of open-ended question we have found to be of great help in understanding the values of a community is based on Bavelas' "echo" technique: "What would be a good thing to happen here in the city of Los Angeles?" followed by "Who or what could cause it to happen?" This very simple questioning format generates an elegant variety of values related to the object, in this case the city of Los Angeles. One ancillary payoff of this particular technique is capturing the verbatim responses, and, thus, the tone and semantic nuances people use to describe their feelings about a given object.

We used this questioning approach almost exclusively in a study of a San Jose, Calif., ghetto. The city government initiated some community action programs which failed miserably. It felt it could not get honest and clear feedback using the standard channels of forums and committees. So we surveyed, using echo, and got a wide variety of opinion as to what people wanted to happen in their area, and who they felt could make it happen, as well as the flavor of their expressed concerns about their community.

Another interesting technique we use is something we call "Alias Smith and Jones," which goes like this:

> Mr. Smith believes that schools are inadequately financed and, therefore, favors a bond issue. Mr. Jones believes that taxes are already too high and opposes any school bond issue. Other things being equal, do you consider yourself to be more like Mr. Smith or Mr. Jones?

Using this format we can elicit an opinion on any highly controversial issue without biasing the respondent's answer. From this particular question we could develop a pro/con education scale.

A variety of other scaling techniques may be used. Another one we're using in Orange County goes like this:

> I'd like to ask you some questions about various bus rates and time schedules that might be offered. For each situation I read, tell me how many times out of 10 trips you might ride the bus to (destination) for 1) work, 2) school, and 3) shopping. Here's the first situation. If there were a bus system that was free and ran one block from your home and reached its destination every 15 minutes, how many times out of 10 trips would you ride it?

They respond to this situation for work, school and shopping, and then we continue through a series of situations, such as:

> If it were 35 cents, ran one block from your home, reached its destination every 30 minutes. . . .

Thus, by altering price and time through the series, we can derive insight into how people value convenience versus economy.

Student: You talk about measuring an attitude toward riding the bus, but who's to say someone's expressed attitude equates to putting bus fare in the box?

Mr. Wirthlin: Good question. In fact, a person may not ride the bus, despite the favorable response to a single question. That's one reason why this is one of those interviews that takes an hour and a half to conduct.

Remember my example of asking whether someone voted in the November election? You can't always accept people at the face value of their responses. But we can still determine, with relatively high accuracy, whether he really did vote by asking him other questions—about past behavior, interest in political campaigns, and knowledge of the election process and the candidates. From these responses we can develop a vote probability scale.

The same is true for the potential bus rider—we ask another series of questions to delineate the gap between what he says his attitudes toward rapid transit are and what, in fact, they are.

The Likert technique is another questioning device that we find very fruitful, particularly in measuring controversial attitudes. The Likert format runs counter to the basic training of a survey researcher which emphasizes that good questions must be scrupulously unbiased in their influence upon responses. Rather than asking the individual a neutral, balanced question, we read him a blatantly opinionated or provocative statement; then ask him to indicate whether he agrees strongly, just agrees, disagrees, or disagrees strongly with the expressed sentiment. Let me give you some examples:

"People like me don't have any say about what local governments do. Do you agree strongly, agree, disagree, or disagree strongly with that statement?"

Another one: "It would be a big adjustment for me to ever use public transportation."

Student: When you use the Likert items does the respondent see the statements on a card?

Mr. Wirthlin: Yes.

Student: I could see if you're doing this orally there might be grounds for some confusion.

Mr. Wirthlin: Exactly. The great advantage of interviewing face-to-face is that you can employ visual displays. You can use what we call card helps so that as the interviewer reads the questions the respondent also sees it, and he can determine whether he agrees strongly, agrees, disagrees, or disagrees strongly.

Still another technique—and one which depends on this visual assistance—is the Semantic Differential. The semantic differential measures image or perception of an object using dichotomous adjective pairs. For example, in measuring perceptions of bus travel characteristics, we show respondents a card with adjectives such as:

Comfortable 1 2 3 4 5 6 7 Uncomfortable

Then we ask them to rate bus service on that scale. If they think that traveling the buses is extremely uncomfortable, they would mark a "7"; extremely comfortable, a "1"; or something in between the two. The key here is for a respondent to go down the list of dichotomous adjectives quickly because "top-of-mind" responses give the most accurate index. In this study some of the other adjective pairs were late/on time, simple to use/complicated, safe/dangerous, old fashioned/modern, slow rush-hour trip/fast rush-hour trip, high status/low status, convenient/inconvenient, unenjoyable/enjoyable, expensive/inexpensive, unreliable/reliable, and relaxed/tense. Then we asked them to judge the same travel characteristics for automobiles.

By comparing the mean or average responses to these two scales, we can profile each of those adjective pairs and generate a map, if you will, of the image attributes of bus travel versus car

travel. We might find that the automobile is viewed as a more comfortable and faster vehicle, but the bus is viewed as less expensive, and so on. Such image responses, in combination with many others, can help define the perceived problems of using the bus in Orange County. You can use this technique in developing perceptions vis-a-vis health care delivery systems, the police force, a political candidate, the community as a whole, or for any object or person to develop some kind of image profile.

Student: Why is a 7-point scale necessarily so much more sophisticated than a 5-point scale? I don't see that what you get from 7 would be more helpful.

Mr. Wirthlin: A lot of research has gone into the psychology of testing, and the number of points on a scale are a simple trade-off between ease of use and precision of measurement. People can handle a 7-point scale with relative ease when it's presented visually. Of course a 5-point scale is somewhat easier and quicker, but even that won't work over the telephone. In that case we are limited to 3 points.

Sample Selection

Another critical step in the implementation of a survey, concurrent with questionnaire development, is sample selection.

Without going into a great detail, let me say that the object of good sample design is simple. Once you define your universe, be it female heads of households who have moved within the last 3 months, or people displaced by a development, or victims of a crime, or those who have had major surgery in a hospital, the sample technique must do only one thing—give every individual in that universe an equal probability or chance of being chosen. If you do that consistently, you develop what's called a probability sample. Slonim, in the assigned reading, goes through, in a rather delightful fashion, a wide variety of approaches to developing and implementing a random sample. The Census Bureau, by the way, is foremost in developing stratified samples which are even more precise than simple random samples. But you can boil all those techniques down to one rule—everyone in that universe has the same chance of being chosen.

Sampling is sometimes called the ABC science—the science of Almost Being Certain. You're never 100-percent certain that results from your sample will correspond with the results of interviewing everyone in the universe. But the great advantage of random sampling over other methods of sampling is that you can precisely calculate the odds of a "mistake," and we call that calculation a confidence interval. You can deal with any comfortable confidence interval—a bigger one if you're a high roller, and a smaller one if you don't like taking risks. Generally, we like to deal with odds that are 95 out of 100. In repeated sampling, there exists a different standard error for each sample. Taken to its extreme, if we were to draw 100 samples and calculate the 95-percent confidence interval for each sample, in 95 percent of our samples the interval will include the true or universal mean, and 5 percent will not. That is to say, we are 95-percent confident our estimate of confidence interval does include the true mean. Sometimes we want odds as good as 99 out of 100. After picking your odds, the width of the confidence interval directly depends on sample size—the larger the sample, smaller the interval. But does this mean we should take samples of 5, 10, or 15 thousand? The answer is generally "no." Let me show you why.

If you had a sample of 384 individuals your confidence interval would be ±5 percent. At 600, it's 4 percent. At 1,536, it's about 2.5 percent. Now look what happens. To buy, if you will, one degree of accuracy, or to shave off 1 percent of our confidence interval, we only had to interview 200 more individuals as we moved from ±5 to ±4 percent. To buy the next degree of accuracy of ±1 percent we would have to interview an additional 936 individuals. Now suppose we want an interval of ±2 percent; we would have to interview 2,400 individuals or an additional 864. If we wanted a confidence interval of only 1 percent, we have to sample 9,600 individuals—an additional 7,200. The relationship between required sample size (given the 95-percent confidence interval) and accuracy becomes almost infinite below the ±1 percent level. In other words, the accuracy of the sample given economic constraints for most surveys dictates a sample size of about 1,500 to 2,000. We deal with considerably larger samples, in some cases, to permit the researcher to speak with a high degree of accuracy about certain small subgroups in the defined universe, or when the need for accuracy is demonstrably evident.

Mr. Barabba: Can you think of an example where you would want to go below that ±1 percent? How about the unemployment rate? You might want one-tenth of 1 percent. Right? The Census Bureau interviewed 50,000 households to determine the unemployment rate. Now you know the cost for that level of confidence.

Mr. Wirthlin: Yes, you really pay for those last tenths of a percent.

The second thing to remember about sampling is the size of the universe really doesn't much influence the size of the sample. If our universe or population is 10,000, we would have to interview 964 individuals to get a ±3 percent accuracy. By interviewing only about 100 more, we can get the same accuracy for a universe of 200 million, or, for that matter, half a billion. So the percent that the sample represents in the universe becomes virtually meaningless after the universe exceeds 10,000.

Student: Do most polls, like the Harris poll, interview about 2,000 people for a national sample?

Mr. Wirthlin: Between 1,500 and 2,000. And now you know why. To buy 1 percent more accuracy, Harris would have to increase his cost considerably. Therefore, unless you have a very specialized problem and are in a position to purchase costly survey research, be wary of very large samples. In most cases, a sample of 1,500 will more than satisfy your needs, contingent, of course, on well-designed random sampling techniques.

Student: Suppose you're interested in a universe of about 10,000 people, and suppose you have to stratify it, just for the sake of discussion, into several separate groups. What rules of thumb now hold in setting the size of the sample large enough to detect whether there are differences between these groups?

Mr. Wirthlin: If you want to make statements about each subgroup, then the requisite sample size depends upon how homogeneous the population is. For example, a chef can sample a huge bowl of soup with only one teaspoonful, but before he dips his spoon he always stirs it so that the mixture is homogeneous.

Student: Let's take the case where the total is not very homogeneous but each of the strata is homogeneous.

Mr. Wirthlin: Then you can get away with relatively few interviews in each stratum. There are statistical techniques such as chi square that can indicate if the differences between subsamples could have occurred by pure chance and the mathematical likelihood of being wrong.

Let's now proceed to the next steps of survey implementation. Briefly, the work of each interviewer is independently validated. Then the interviews are coded to a series of numbers. The computer checks the consistency of the respondent, and generates a series of cross tables. These tables form the basis, a la Rosenberg, for the analysis.

Primary and Secondary Data Linkages

Let's now discuss the linkage between primary and secondary data and show how these linkages can be used to solve some of the problems that you deal with.

A lot of the data that city planners work with is ecological; it focuses on the study of territorial and spatial environments of human activity and variations among units at some level above the individual. Frequently, the use of secondary ecological data makes it difficult to tease out the relationships between independent and dependent variables. At the extreme, the association of an ecological variable (a place variable, e.g. urban/rural) with some other macro variable (political participation) can lead to gross analytic error.

For example, if one examined aggregate ecological data relating only urbanization and political participation in the Western World over the last 175 years, a seemingly logical inference is urbanization increased political participation. However, when survey research data including such items as education, age, income, etc., are collected in these same areas, other variables are found to influence voting behavior, and the logical link is less fortuitous.

Let me give you a more dramatic example. In Denmark, there is a close correlation between the number of babies born and stork nests, per square mile. It would be ridiculous to conclude one causes the other. But, we must ask why there is such a relationship. The answer is population density. The houses have chimneys, and where there are more chimneys, the probability of having a stork nest increases because storks nest in chimneys. Chimneys also represent households. The more households, the higher number of babies born per square mile. So our initial correlation is more a coincidence than a causal relationship. The same thing happened in my first example. It wasn't urbanization that caused increased political activity, but other factors.

When you compare one global characteristic with another global characteristic you expose yourself to the chance of committing the ecological fallacy. By extrapolating from test factors generated from individuals through survey research you greatly reduce the risk of falling into this analytic trap. The process of elaboration brings other variables into the analysis to see whether, in fact, the relationship between the first two versions holds or disappears. If it disappears, as it does when we relate crime rates to racial characteristics, then we know that the relationship is spurious. Thus, survey research can be used to strengthen and illuminate whatever secondary data resources you might have at hand.

In summary let's identify some analytic strengths of survey research. First, it can identify your explanatory variables. That is, it can say age and income, not race, are the major factors that influence crime rates.

Second, it has the great advantage, as we discussed earlier, of being able to focus on any particular subgroup.

Third, survey research can be used to measure the impact of policy. The Orange County (Calif.) Transit study provides an example. An initial study determines the attitudes toward transit systems. A transit system is developed in accord with those attitudes; we can then monitor the success of that program via popular response.

Fourth, survey research can also be used to measure the impact of situational change. We select a group of people and measure their status, be it economic, political, or social. After some change has been induced, this same group can be reinterviewed, say, 3 or 4 years later, to determine the effect of change. An example of this type of study is the evaluation of the public employment program (PEP). Enrollees were interviewed prior to their entry into the program and reinterviewed during it. Now we're following up with a post-PEP interview to determine where they are and what they're doing.

Fifth, you can also use survey research to measure the acceptability of various alternative courses of action. Economists have always avoided making value judgements about "socially preferred" actions. Economic efficiency can be measured, but how do you measure which of four economically efficient policies is best for the public? Survey research can develop a social value or welfare function that can help decide whether the city fathers should build a park, widen the roads, or build new schools based on need as defined by potential usage and desires.

Last, survey research can be used as a feedback mechanism by continually monitoring the attitudes in a given community about a wide variety of subjects.

Some Case Studies

Let me quickly go through some of the projects that have been done in these areas and share with you some of the results.

In the spring of 1973 the California cities of Downey, Bellflower, Lynwood, Paramount and Compton commissioned a survey research project. One question asked was, "What do you consider to be the most important problem facing your city today?" If you look at the aggregate data (table 1), most were concerned about crime and the police force; pollution and noise rank a very poor second; teenagers and youth, third; and streets, freeways and parking rank fourth. Measurable concern about education, drugs, moral decay, shopping centers, racial problems, pocketbook issues of taxes and inflation, and unemployment also emerged. These categories are created from the free responses to the question above. We didn't hand people a card and ask which of these problems they felt were most important. We let them respond in any way they wished, while the interviewer recorded the verbatim responses. Later our coders wrote those responses on cards and then placed the cards in logical categories—police, crime, and so on—based on the analyst's subjective judgement. In this case, the people said the crime rate was too high, therefore, we need more police. The problem wasn't police brutality or inefficiency. So, grouping them was analytically valuable, although they could be separated in other studies.

Now, look at the differences that emerge when we compare these concerns between the various cities. In Compton over half

of those interviewed identified crime as the most important problem that city faced. Second was teenagers and youth. More than 7 out of 10 people in that community were upset about crime and youth-related problems. On the other hand, Paramount residents were much more concerned about pollution and education than crime. In Lynwood there were streets, freeways and parking, and racial problems at the forefront. In Bellflower it was shopping centers; in Downey, streets, freeways, drugs, and moral decay.

Now if we had simply taken the aggregate data we would have been more than half blind. When you begin separating the data by city, only then does it have significance in terms of a public administrative action agenda that makes sense for residents of Compton, Paramount, Lynwood, Bellflower, and Downey.

Now let's look at the measured level of concern about the drug and crime problems (table 2). In this case, we categorized the data by age, sex, and geographic area. Clearly age differences influence attitudes about drugs. Of those 18 to 24 years old, 55 percent said they were very concerned about drugs, in contrast to 82 percent of those 60 and over. The same relationship between age and increasing concern exists for crime. Also, females expressed more concern about drugs and crime than did males.

The study we've been discussing was an in-home interview situation. Now let me turn to a different kind of study completed early in 1974 in San Diego with postcard interviews. We seldom use this type of interview mechanism because in most cases it

Table 1. MOST IMPORTANT CITY PROBLEM

(Percent)

Problem	Aggregate	Downey	Bellflower	Lynwood	Paramount	Compton
Crime/police force	23	17	8	21	12	56
Pollution/noise	12	13	12	4	23	7
Teenagers/youth	11	8	6	4	15	21
Streets/freeways/parking	10	15	4	33	4	2
Education	8	6	10	4	23	0
Drugs/moral decay	7	19	10	0	0	0
Shopping centers	7	0	25	0	0	2
Public/recreation facilities	5	6	8	4	8	0
Pocketbook (taxes, inflation, unemployment)	4	6	4	4	0	2
Racial	3	0	0	25	0	0
No problems	4	4	2	0	15	2
Other	6	6	11	0	0	7

Table 2. PUBLIC CONCERN OVER DRUG AND CRIME PROBLEMS

(Percent)

Characteristic	Drugs			Crime		
	Very concerned	Moderately concerned	Not concerned	Very concerned	Moderately concerned	Not concerned
Aggregate	77	20	3	85	14	2
Age						
18 to 24 years	55	45	0	60	40	0
25 to 34 years	76	20	4	87	9	4
35 to 44 years	78	19	3	88	13	0
45 to 59 years	82	16	2	86	12	2
60 years and over	82	14	4	90	10	0
Sex						
Male	72	24	4	83	15	2
Female	82	16	2	87	12	1
City						
Downey	86	14	0	80	20	0
Bellflower	77	22	2	82	14	4
Lynwood	52	41	7	82	19	0
Paramount	82	15	4	89	12	0
Compton	82	13	4	93	4	2

raises serious questions about how random the responses may be.

Specifically, a mail questionnaire's validity rests on the kind of response rates generated. To get valid results using this technique you must do one of two things: either invest sufficient resources to boost your response rate above 70 percent, or sample the nonresponses to see if they were of different age, income, or occupation groups, or whether they had different attitude sets than those who did answer.

Then, what's the advantage of this technique? We interviewed 5,000 people in San Diego at less cost than we interviewed 450 respondents in the Compton/Paramount areas because of the sampling technique. Our initial recovery rate was above 50 percent without any followup letters. A sample of the nonresponses confirmed that that population as a whole did match the responding population.

This San Diego study illustrates the kind of survey research data that can be generated with relatively little expense. Let's review how the survey was conducted and then consider some of the results.

The city manager sent the following letter (exhibit 1) to all residents with their water bills. Note that the letter and the interview were provided to respondents in both English and in Spanish (exhibit 2). An article also appeared in the **San Diego Union** which described the survey and said it would be used to help the city evaluate community needs; undoubtedly this helped improve the high recovery rate obtained for such a quick and inexpensive survey.

EXHIBIT 1

OFFICE OF THE CITY MANAGER, CITY OF SAN DIEGO

We need your help.

The City of San Diego is conducting a survey among its citizens, and you are one of several hundred who has been selected at random to participate in this opinion poll.

Answering the questions on the enclosed questionnaire will take only a few moments of your time. After you answer the questions, simply detach the stub and return the large portion of the completed questionnaire with your utility payment. There are no right or wrong answers, but your response is very important to the accurancy of this survey. Your ideas will be added to those of others and will give us a better understanding of what the total community thinks.

We do not need to know your name. We do need your ideas and assistance. Thank you in advance for helping us in this important task.

Kimball H. Moore, City Manager

THANK YOU FOR YOUR HELP

If you have any questions please call the Comprehensive Management Planning Program Office at: 236-6060

QUESTIONNAIRE

[1] Recycling solid wastes would conserve land. Would you be willing to set out cans and bottles in a separate container for collection? ☐ YES ☐ NO

[2] For each recreation program listed below, please check those you feel should be paid for by the City and those which should be paid for by the user:

	RECORD BELOW	
	Paid for by City	*Paid for by User*
Fresh Water Fishing Opportunities	☐	☐
Golf Programs	☐	☐
Athletic Programs	☐	☐
Aquatic Activities	☐	☐

[3] Would you name two recreational activities or facilities most needed in the City of San Diego?_____/_____

[4] Sex: ☐ MALE ☐ FEMALE

[5] Age: ☐ 18-24 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55-64 ☐ 65 & OVER.

[6] Race: ☐ CAUCASIAN ☐ MEXICAN-AMERICAN ☐ BLACK ☐ ORIENTAL ☐ OTHER (Write in)_____

[7] Home Ownership ☐ OWN HOME ☐ RENT

[8] Highest Grade of Formal Education: ☐ 1-8 ☐ 9-12 ☐ 1-3 YRS. COLLEGE ☐ 1-2 YRS VOCATIONAL SCH. ☐ 4 YRS COLLEGE ☐ POST COLLEGE GRAD.

EXHIBIT 2

Estimados Residentes:

Necesitamos su ayuda.

La Ciudad de San Diego esta llevando a cabo un estudio entre sus residentes que pagan agua y usted es una de las personas que hemos escogido para participar.

Necesitará solamente unos minutos de su tiempo para contestar este cuestionario. Simplemente despege la porcion mas chica y envie la porcion mas grande con su pago de agua. Por favor no se le olvide incluir el cuestionario, puesto que es muy importante para le exactitud del estudio. Sus opiniones junto con otras opiniones nos dirán lo que desea la comunidad entera.

No necesitamos su nombre solamente su ayuda e opiniones. Muchisimas gracias por su ayuda en este estudio importante.

K H Moore

Kimball H. Moore, Aministrador de la Ciudad

MUCHISIMAS GRACIAS POR SU AUSILIO

Si tiene alguna pregunta por favor, llame a la oficina Comprehensive Management Planning al telefono 236-6060

CUESTIONARIO

1. El procesar despeirdisios sôlidos ayudaría a conservar terrenos. ¿ Esta usted dispuesto a separar botes y botellas de su basura? ☐ SI ☐ NO
2. Favor de marcar su respuesta abajo de cada Programa Recreativa que debe ser pagado por La Ciudad de San Diego o el usuario:

	Pagado por la Ciudad	Pagado por el usuario
donde pescar en agua dulce	☐	☐
Programas de Golf	☐	☐
Programas de Atletismo	☐	☐
Programas Acuaticas	☐	☐

3. Nombre dos Programas Recreativos que asen falta en la Ciudad de San Diego: _____/_____
4. Sexo: ☐ MASCULINO ☐ FEMENINO
5. Edad: ☐ 18-24 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55-64 ☐ 65 O MAYOR
6. Raza: ☐ BLANCA ☐ MEXICAN-AMERICAN ☐ NEGRA ☐ ASIÁTICA ☐ OTRAS (indíquese)_____
7. Propiedad: ☐ DUEÑO DE SU CASA, O COMPRANDO ☐ RENTA SU CASA
8. Grado más alto de educacion: ☐ 1-8 ☐ 9-12 ☐ 1-3 AÑOS DE UNIVERSIDAD ☐ 1-2 AÑOS DE ESCUELA VOCACIONAL ☐ AÑOS DE UNIVERSIDAD ☐ GRADUADO DE UNIVERSIDAD

Let's look briefly at some of the results that came out of this little survey to demonstrate its value to public administrators. From table 3 it is clear that the citizens identified a wide variety of recreational needs. For example, in census subregions 1 and 2, individual sports were most important. Supervised recreation was very much desired in region 5—southeast San Diego.

In summary, as a result of the survey, the city of San Diego had some idea of how best to allocate its scarce resources among the various possible recreational activities in each region.

We also did a study in San Francisco designed to assess the public's priorities for improving city services based on a willingness to pay taxes. If you go out and ask people whether they want a better environment, a better education for their children, more effective police enforcement, or faster transporation, of course, they'll say "yes" 99 percent of the time. But, if you ask whether they're willing to spend more to have that service, even to the point of increasing taxes, a much more realistic priority list emerges. The San Francisco results are displayed in table 4.

Student: I think an interesting thing would be to isolate the people that don't have children in school and examine their spending priorities for the city to see if they would pay more money for secondary and elementary education.

Mr. Wirthlin: Undoubtedly great differences among these types of subgroups would result. Aggregate results don't tell the whole or the most important side of the story. To utilize survey data well you must break down the aggregate by family size, education, income, location, etc. Only then can you begin to use

Table 3. RECREATION PROGRAM NEEDS BY CENSUS SUBREGION

(Percent)

Program	Aggregate	Census subregion									
		1	2	5	6	10	11	13	14	17	22
Parks/picnicking.....	17.8	13.4	16.5	22.5	19.9	17.0	15.9	17.0	15.6	20.1	37.8
Individual sports.....	17.2	18.1	21.4	11.7	12.3	17.9	17.6	23.2	22.2	14.7	15.6
Trails.....	13.4	12.5	9.9	5.8	15.1	14.7	16.2	11.6	16.0	13.3	2.2
Swimming pools.....	10.7	10.6	11.0	14.2	9.7	11.6	11.7	10.3	6.6	12.1	8.9
Supervised recreation.....	10.4	10.9	11.0	15.0	9.7	9.2	10.7	10.3	12.7	8.6	11.1
Ocean-bay activities.....	6.4	9.0	7.1	7.5	5.6	8.4	5.2	3.1	4.2	6.5	4.4
Camping.....	2.7	2.8	3.8	2.5	3.2	2.7	2.4	3.1	.9	2.1	2.2
Team sports.....	1.9	1.9	1.1	5.0	1.7	1.3	1.4	1.3	2.4	2.7	4.4
Lake recreation.....	1.5	.6	2.2	1.7	1.5	1.3	.7	1.8	2.4	2.1	0
Senior citizens activities.	1.4	2.8	.5	2.5	1.5	1.5	1.0	.9	0	1.2	2.2

Table 4. PRIORITIES OF SERVICES AND ACTIVITIES BASED ON WILLINGNESS TO PAY

(Percent)

Program	Spend more despite tax increase	Spend more if no tax increase	Spend less	Don't know
Cleaning up—protecting the environment.....	68.8	24.3	5.2	1.8
Elementary education.....	52.1	34.6	10.9	2.4
Secondary education.....	50.6	36.4	10.4	2.6
Police enforcement.....	46.4	33.1	18.6	1.9
Public transportation.....	39.9	43.3	14.4	2.4
Downtown redevelopment.....	25.0	42.4	30.4	2.3
Increase foreign trade.....	17.5	44.4	32.7	5.4

the data effectively as a policy tool. Once you understand where the sources of support and strength for a given program lie, you then can advance policy options that have a higher chance of succeeding.

Student: What happens when you analyze that information and find there are groups that don't want to spend more money for education, or want to determine how and where the money is spent? Making it public just reinforces the antagonism against a lot of things that can't get through the legislature anyway, right?

Mr. Wirthlin: That's right. Information is power. How information in a policy frame of reference is used depends on what your objectives might be. For instance, one use of this study may have been to help pass a school bond election. If that's the objective of this study, it has one use. On the other hand it could have been bought by taxpayer's groups who wanted to block further bonding for schools, and for them it would have another use. Or, it could have been funded by a board of supervisors who wanted to know how the community ranked its own spending alternatives.

Student: Let's say I came to your firm and said, I want you to find out some information that I could use against the powers that be. Would you go out, understanding where I'm coming from, and get the facts and figures to support me?

Mr. Wirthlin: Not necessarily. We don't accept as clients all those who seek our services.

Student: What is your role once the survey results are compiled? Are you in a position to act as a consultant? Do you shy away from that or do you refer the client to someone else?

Mr. Wirthlin: I think the name of our firm, Decision Making Information, defines our role. We provide individuals or groups with information. They make decisions from it. Now, we can partially bridge the gap between the data and its implementation in policy by listing the options. But the client would have to say, "Given my own set of interests, given my knowledge of the community, given my assessment of the situation, this is what I want to do."

Student: Could you give some more examples to illustrate the scope and size of some of the survey projects?

Mr. Wirthlin: One of the larger studies that we completed recently involved estimating gains from the Federal Government's job training programs. We sampled, as I recall, over 5,000 trainees in their homes and interviewed them again 12 months later.

Let me show you two tables generated from that study to give you an idea of some of the things that were determined about program participants. Naturally, we produced tables showing demographic variables, such as sex, age, education, race, ethnic background, marital status, etc. Other variables used in the study included position in household, size of the household, language spoken in the home, and welfare status (currently on welfare) (table 5). Also, we measured some psychological variables (table 6).

This study took about a year and a half to complete and indicated that both on-the-job training and institutional training substantially increased the incomes of those individuals who completed the training, and also reduced unemployment among this target group.

We've also done work with vocational training of the handicapped. We have conducted studies for police agencies, identifying their image and gauging their acceptance in the community; we have worked for various community action programs; for the Peace Corps; and we did some of the early work on the new program of interviewing victims of crime.

Student: Do you think you might be doing something for the Probation Department?

Mr. Wirthlin: We haven't worked directly in probation, but we have done some work for law enforcement. In any one year we have between 150 and 200 different projects.

Student: How does a person who needs research go about finding the right group?

Mr. Wirthlin: There are a number of suppliers of this type of research. If I were looking for a good survey research firm, I would start with an academic recommendation or with a list of survey research firms belonging to the American Marketing Association or the American Association for Public Opinion Research. I would select three or four from those listed and ask each firm to supply me with a brief description of its experience, sampling, and data analysis techniques. Then, to gain some measure of their professional competence, I would also look at the educational background of their staff. On the basis of this information I would narrow my choice to two, and from these request the names of some of their clients and determine if they

Table 5. HOUSEHOLD ENVIRONMENT OF JOB TRAINING PARTICIPANTS

Environmental characteristics	Sample size (Number)		Proportional distribution of sample (Percent)	
	Institutional	On the job	Institutional	On the job
Total	3,467	1,702	100	100
Position in household				
Household head	1,940	910	56	54
Other	1,527	792	44	46
Size of household				
One member	289	102	8	6
Two	590	282	17	16
Three	736	387	21	23
Four	642	355	19	21
Five	470	238	14	14
Six or more	740	338	21	20
Language spoken in household[1]				
English	3,394	1,684	98	99
Spanish or Portuguese	407	155	12	9
Other	160	[2]98	5	6
Welfare status				
Currently receiving welfare	822	251	24	15
Previously received welfare	504	171	14	10
Never received welfare	2,141	1,280	62	75

[1]Use caution when interpreting results from these subgroups because of small number of sample cases.

[2]Adds to more than total group because of bilingual households.

Table 6. PERSONAL OPINIONS OF JOB TRAINING PARTICIPANTS

Opinion	Sample size (Number)		Proportional distribution of sample (Percent)	
	Institutional	On the job	Institutional	On the job
Total	3,467	1,702	100	100
Value placed on work				
High	2,692	1,339	78	79
Moderate	555	275	16	16
Low	220	[1]88	6	5
Value placed on self-direction				
High	1,198	585	34	34
Moderate	1,302	684	38	40
Low	967	433	28	26
Levels of aspiration				
High	602	385	17	23
Moderate	901	468	26	27
Low	1,964	849	57	50

[1]Use caution when interpreting results from these subgroups because of small number of sample cases.

have been satisfied. Next, I would ask each to submit a proposal related to my specific research task.

Student: How much time would you spend with me on a proposal?

Mr. Wirthlin: It depends upon the potential size of the contract. We develop proposals that cost $20.00; we have put out others that have cost $5,000. Every client who has asked for a proposal has been given one; it is the best check you can use when you go into the market place to purchase survey research.

Student: Is the employment training survey an example of one in which you began with the null hypothesis?

Mr. Wirthlin: Yes. The null hypothesis was that training didn't make any significant difference in income or employment. As it turned out, it did.

Student: Now, that is different from the survey in the Paramount/Compton complex. That sounded more like a descriptive study, where you just asked people what they thought.

Mr. Wirthlin: Yes, it was more descriptive, but we were gathering data against the null hypothesis that pollution and not crime was the burning issue of concern in the area. It turned out that the data showed crime, not pollution, to be the major concern in the specific communities.

In most cases, you begin by stating your objectives, what you want to do. The survey researcher will work with you to set up your null hypotheses, design the questionnaire, and create analysis that will be responsive to the specific needs initially identified. But you must know what you're really after; the survey researcher can't identify your objectives for you.

Student: How sophisticated are those working in the public sector as far as understanding your methodology, approaches, capabilities, and limitations? Do you find that you have to educate people who seek your services?

Mr. Wirthlin: Over the last 10 years there's been some increase in the knowledge people have about the use of attitude measurement and survey research. Five years ago, I spent at least half of my time explaining to people the use and usefulness of doing survey research in the public sector. Today, I probably spend less than 10 percent of my time in this activity.

Student: Has there been a tremendous proliferation of firms like yours in the last 10 years?

Mr. Wirthlin: Yes, but our industry remains one that is dominated by 9 or 10 relatively large firms and a large number of small, one- or two-man operations.

Student: In your proposal, do you state the research question and the null hypothesis?

Mr. Wirthlin: Not always. Sometimes the null hypothesis is implied. We begin our relationship with a client by saying, "If you could answer the five most important questions in regard to this project, what would they be?" He states the survey's objectives in terms of his own questions. We aren't always able to answer everyone's questions because some may be beyond the realm of measurement.

Student. Is there any attempt within the industry to integrate the kind of information that's generated or make it available generally? For example, you might do a particular study about crime for a particular government agency in a certain area and find that another overlapping county has contracted with a

separate organization to generate parallel or similar data, or perhaps even conflicting data. Is there any attempt to integrate that kind of information in either the public or the private sector?

Mr. Wirthlin: The Federal Government provides a search service called N.T.I.S. (National Technical Information Service) which tracks all research done by the Government. For a relatively small fee this agency will tell you what studies are available in your areas of interest, and these may be purchased at nominal cost. Also, DMI and other research firms donate a lot of information to various university data banks. So, some is available through those data banks.

Mr. Barabba: The Government also deals with this problem through the Office of Management and Budget. As a government agency, you cannot conduct a survey of more than nine people in the United States unless you have an OMB clearance for it. The purpose of this is to avoid asking duplicate questions of similar groups. Also, if the questions had been asked before, and there is some value to asking it in a similar way, it is the function of OMB to insure proper coordination.

Student: With what kind of time factor can you operate without sacrificing reliability?

Mr. Wirthlin: Last week we got a call on a Friday afternoon for a particular study from a client who needed results by Tuesday. We drew the sample, did the interviewing, computer and written analyses within 3 days. However, on the average, a study involving between 500 and 800 interviews would take about a month from the time the client and DMI agree on the interview schedule until we present results.

Student: What kind of interviewers do you use? Do you hire professional interviewers?

Mr. Wirthlin: We hire professional interviewers, but we train them specifically for each study. We put out a training manual on our larger studies that explains the reasons for, and the subtleties of, every question. The interviewers then go through a practice interview that's tape recorded and played back to them with a supervisor who corrects, advises, and encourages the interviewer to insure that interviews are conducted in a uniform and proper fashion.

Student: How do you estimate the cost for your client?

Mr. Wirthlin: The cost is determined principally by the size of the sample, the length and complexity of the interview schedule and the type of interview (in home, telephone, mail). We've done enough of these so that we can estimate within 5 percent what our cost will be and, in most cases, quote a fixed price.

Student: You say that your Los Angeles office does a lot of national work. What do you do about interviewers? Do you take them with you or do you recruit them at that particular site?

Mr. Wirthlin: We have supervisors in just about every area of the United States. For a large study, the major supervisors from Decision Making Information meet the field supervisors and are present during the training session. It is the responsibility of the field supervisors to see that the interview is conducted in the proper fashion.

Let me close by reminding you of Bacon's statement, "Knowledge is power. But mere knowledge is not power, it's only possibility. Action is power and its highest manifestation is when it's directed by knowledge." I hope you have gained some insight into the particular kind of knowledge we call survey research so that you can manifest whatever good intentions you have in helping to build a better society.

THE GRAPHIC PRESENTATION OF STATISTICS

Vincent P. Barabba, Director, U. S. Bureau of the Census

> In a period of history such as ours, there can be little doubt that accurate, relevant, timely, complete, and easily comprehensible data are essential.
>
> Vincent Barabba

Note: During the first lecture each student was given a census tract book of Flint, Mich., which was identified only as Center City. Each was also provided with 10 blank census tract maps of Center City and assigned the following problem discussed during the presentation:

> Remembering that each of you may represent a different profession or sphere of interest, assume that your immediate supervisor is going to Center City tomorrow, and that he has asked to be provided with an overview of its most relevant social and economic characteristics. In assigning the project, he indicated that there would not be time for him to read a detailed report. Therefore, you were instructed to prepare not more than 10 descriptive maps of Center City to be used as background material during the trip there.

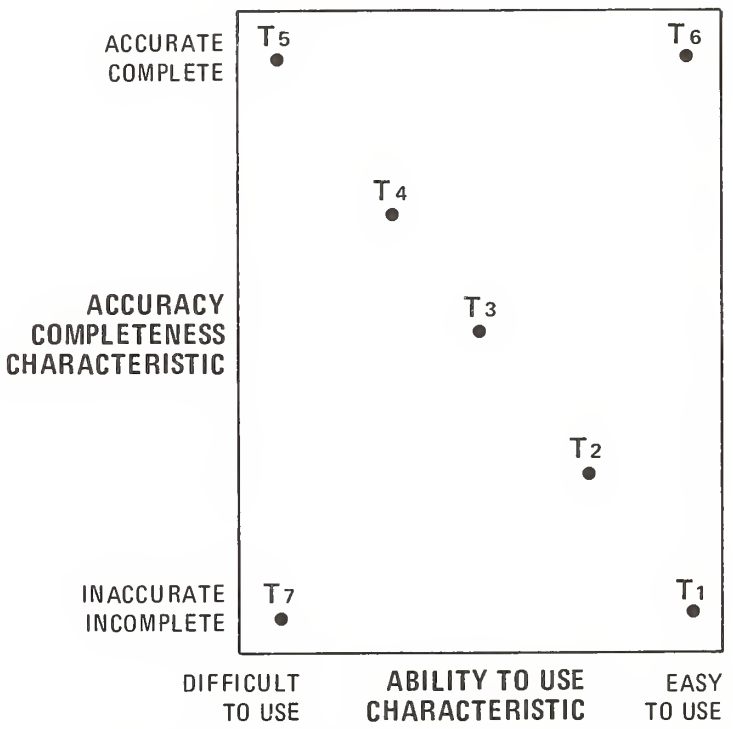
The students prepared their maps based on the information contained in the census tract book. Their maps displayed colored tracts showing such varied information as median income, income over $25,000, the black population, median education, age of housing structures, and the number of families.

It was apparent that the number of possible factors to be displayed would exceed the 10-map limit, and even 10 maps would be cumbersome in reaching conclusions quickly. If only a few maps were used, the information each supervisor desired had to be clearly defined. However, Mr. Barabba pointed out that one might employ a color-coded map, using certain highly meaningful measurements, that provided persons, having a variety of specific goals, a composite tool with which to make relevant judgments.

Mr. Barabba: Our basic purpose in presenting data graphically is to make it easier to use. Also, we hope to gain additional insight into the practical aspects of data by displaying the tables in a spatial setting. Then, we can see the interrelationships of small-area characteristics.

There is, however, a basic trade-off involved in these endeavors. First, the cost of graphic presentations is generally more expensive than those of a tabular form. Second, a graphic display's cost generally necessitates presenting only a portion of the available data. So to some extent electing a graphics approach represents a balancing between two important characteristics of statistical presentation: (a) Accuracy and completeness, and (b) ease of use. The following chart illustrates the dilemma.

Technique T_1 represents plotting a single variable on one map. In that case the information is very easy to use, but it is certainly not a complete community description, and it probably will not be as accurate as a map containing several variables. Technique T_5 represents the complete census tract book which is very complete but may be extremely difficult to use, and the accuracy of the conclusions drawn from the book may be questionable for that reason. The ideal situation is technique T_6 representing ease of use without any loss of accuracy or completeness. We want to avoid technique T_7 at all costs. However, ideals are always difficult to obtain, and techniques T_2, T_3, T_4 represent situations that fall between the extremes. There are at least three factors that influence where a statistical presentation falls within the scale: The importance of the judgment to be made; how important accurate information is to the quality of the judgment; and how much time is available to make the decision.



Take the problem that was assigned to you. What were the main points of the assignment? Your supervisor wants general background characteristics of Center City; specific detail or comprehensiveness is not required. However, he does want it to be accurate. Second, he does not have a lot of time to analyze the results of the report. Third, you have no idea of the importance of his initial assessment of Center City.

Let's review your assignment in the context of the trade-off between accuracy and ease of use. We could go to the census tract book that contains all the data on the census tracts of Center City. When viewed as a whole, these data represent the key to providing insight into certain complex phenomena about the city. These data are quite complete, compared to the normally available data concerning cities. Certainly, there are benefits to using

tract data, although it is difficult and time consuming—a condition contrary to your supervisor's needs. The alternative to the tract book approach is to develop a map format that is easy to use; although, by its nature a graphic display cannot include minute detail, and that's the trade-off. Given your supervisor's need for an overview of Center City, less than complete information might be acceptable.

This approach of graphically displaying data is exemplified by a concept known as Social Area Analysis (SAA).[1] The basic building blocks of SAA are drawn from Census Bureau tract books. Depending on the purpose, the use of census data in its published forms may present problems. Census information is presented in a variety of ways, including census maps, congressional district data books, the published results of the decennial and economic censuses, electronic tapes, punchcards, and others. Another problem is that the varied forms of census data are more than matched by their volume. In fact, the decisionmaker's dilemma can be summed up as possessing too much, rather than too little, information. One need only thumb through the published results of a census of housing and population to realize how difficult it is to translate that mass of data into a useable area information profile for decisionmaking.

You will recall from our first lecture the discussion of chart 5 (page 4) where I suggested that there is a relationship between the degree of certainty a decisionmaker requires before he is willing to commit to a decision and how much that certainty of choice will cost in time and money. The SAA approach was represented by the upper curve of chart 5, where selected variables are calculated to contribute a greater degree of explanation in a more concise manner than would otherwise be possible. There are many other methods available to synthesize data items into more useable indices, and I have selected SAA because of its simplicity and, equally important, because it has been empirically proven.

To accomplish the original goal of easily and accurately describing a particular phenomenon, we need to determine the fewest specific variables that will get us further along on the easy-to-use scale without sacrificing accuracy. SAA organizes the myriad of potential variables into classes which Shevky and Bell believe accurately describe economic, family or ethnic characteristics (fig. 1). But, to absorb even this ordered information can prove quite difficult. Therefore, the information is further reduced to three basic indices as shown in figure 2.

Economic Status

The index of economic status is made up of two factors selected because they accurately reflect many other factors. The two elements that have been found to best describe economic status are education and occupation. Income, for example, is not used because income and education are generally related. There is also the problem that a college professor may earn less money than a truck driver. Therefore, economic status is not measured

FIGURE 1.
IMPORTANT VARIABLES

Total population
Race
Sex
Nativity
Married couples
Families or unrelated individuals
Number of dwelling units
Owner- or renter-occupied dwelling units
Type of structure
Condition and plumbing facilities
Year structure was built
Number of all occupied dwelling units
Number of persons in dwelling unit
Number of households
Population per household
Population in households
Institutional population
Years of school completed
Residence in 1955
Income
Age
Marital status
Employment status
Major occupation group
Women in the labor force
Persons per room
Type of heating fuel
Refrigeration equipment
Television
Monthly contract rent
Value of one-dwelling-unit structures
Spanish surnames (certain areas)

ORDERED

Economic Characteristics
- Condition and plumbing facilities
- Persons per room
- Years of school completed
- Income
- Employment status
- Major occupation group
- Type of heating fuel
- Refrigeration equipment
- Monthly contract rent
- Value of one-dwelling-unit structures

Family Characteristics
- Sex
- Married couples
- Families or unrelated individuals
- Owner- or renter-occupied dwelling units
- Type of structure
- Age
- Marital status
- Women in the labor force
- Institutional population

Ethnic Characteristics
- Race
- Nativity
- Spanish surnames

FIGURE 2.
Indices

Index of economic status
- Education
- Occupation

Index of familization
- Fertility ratio
- Women not in labor force
- Owner-occupied dwelling units

Index of ethnic status
- Race
- Nativity
- Spanish surnames (when available)

[1] The original idea and the basic statistical technique from which SAA was developed must be credited to Professors Eshref Shevky and Wendell Bell and their outstanding work on Social Area Analysis. Those interested in discussions of this technique should consult: **Social Area Analysis**, Eshref Shevky and Wendell Bell (Stanford University Press: Stanford, Calif., 1955), Stanford Sociological Series, Number 1 or **Community Structure and Analysis**, Marvin B. Sussman, Editor (Thomas Y. Crowell Company: New York, 1959).

simply by the amount of money people earn. For our purposes, economic status is a cross between the type of work and the attainable goals or status that a good education implies.

We will soon discover that descriptions are not as accurate when we reduce the number of variables included. While it is much easier to use only two characteristics, the description is really not as complete as if we used all those available. We have created a definition of that status based on those subjective judgments. This definition places us someplace along the scale between ease of use and completeness and accuracy within our decisionmaker's matrix. If you accept as adequate my definition of economic status, described by the person's job and education, then we are further along the accuracy scale than if you argue that income is just as important as occupation or education. Both the provider of information and the user should be aware of this trade-off as they attempt to synthesize reams of data into easy-to-use formats.

In social area analysis, information concerning education is secured by determining the ratio or proportion of the census tract residents over 25 years of age who have less than an eighth-grade education. Therefore, the greater the proportion of residents over 25 years of age with less than an eighth-grade education, the lower the education score for the census tract.

Occupation information is secured by determining the ratio or proportion of residents of a census tract who are classified as laborers, operatives, or craftsmen, as opposed to secretarial, sales, professional, etc.[2] That is to say, we develop a blue collar–white collar ratio. Therefore, the greater the proportion of residents who are classified as laborers, operatives or craftsmen, the lower the occupation score for the census tract.

Familization Status

The term "familization" represents three ratios: Fertility, women not in the labor force, and owner-occupied dwelling units. These selected variables are intended to indicate changes in the structure or function of elements within society at a level higher than the immediate family. Fertility is intended to reflect differences in the relation of the population to the socioeconomic system. And measures of housing type and women not in the labor force should show differences in the function and structure of the family.

Obviously, one characteristic of familization is children. Consequently, we use a fertility ratio–the number of children under 5 years of age in relation to the number of women 14 to 44 years, the child-bearing age span. Therefore, the greater the proportion of children under 5 years of age in relation to women 14 to 44 years, the higher the familization score for that census tract.

The second characteristic of familization is the mother's role. No one would deny that the family situation of a working mother is different than that of a nonworking mother. Therefore, we use the measurement of women not in the labor force. The greater the proportion of women not in the labor force, the higher the familization score for that census tract.

The third characteristic of familization involves housing information. Family situations differ according to the types of housing units occupied, and historically it has been the case that where persons owned their home the structure itself was that of a single family dwelling unit. And, naturally enough, single family units differ, to some extent, from multiple unit living in terms of life style and social attitudes. For the 1960 tract book we are synthesizing it was safe to assume that owner-occupied dwelling units were single-family structures. However, with the rise of condominium living we may need to alter our characteristics.

By combining these three factors, many different family situations can be quickly and easily described. For example, a high score of familization would describe a neighborhood which is primarily made up of families having several children (fertility ratio), living in single-family housing units (single-family dwelling ratio), and with wives who generally remain at home (women not in the labor force).

A possible index of ethnic status could be derived from three factors: Race, nativity (country of origin of first- and second-generation Americans), and Spanish surnames. (In the censuses of 1960 and 1970, there was a special section developed for Spanish surnames in the southwestern States. It is only available for that section of the country.) In the interest of brevity, we will not go into depth on the ethnic index, although the same principles of graphic presentation would apply to it as well.

Developing Indices

Let me next explain how SAA information may be arranged for reading from computer printouts. As we read through these printouts we'll focus on tracts 1 and 16 as our examples.

Figure 3, "SAA Economic Index" consists of the occupation and education factors discussed earlier. First, look at the occupation ratio. This column indicates that in tracts 1 and 16, for every 1,000 employed people, 642.7791 and 166.5804 persons respectively, are classified as laborers, operatives, and craftsmen. Under the education ratio column, for every 1,000 persons over 25 years of age, tract 1 has 434.2468 that have not gone past the eighth grade and tract 16 contains 115.9570 that have not.

The column titled "Std. Score" (standard score) represents a simple concept. This technique permits us to place a great many variables on a comparable scale by putting each geographic unit's ratio for a specific variable on a scale of 0 - 100.[3] This allows us to view the relationship not only between the variables within each geographic unit but also between the variables in different units, using the standard score. However, this scale is not a mere rank order. Rather, the computation places the given geographic unit's ratio for a given factor in relationship to all other geographic units in the area under study.

By adding together a given tract's standard scores and dividing by the number of factors involved we derive the economic index score. After each economic index score appears the number 1, 2, 3, or 4, representing the division of the index into four parts. The lowest portion, 0-24 is designated 1; 25-49 is 2; 50-74 is 3, and the highest, 75-100 is 4.[4]

[2] "Operatives" is a general classification of workers falling somewhere below a craftsman in level of skill required and being namely those who operate machinery excluding those engaged in the operation of transport.

[3] The formula for determining the standard score is detailed in Shevky and Bell's works, op. cit.

[4] We also could have divided the scale on the basis of the percent of tracts that fell into various categories (e.g., top 25 percent or lowest 25 percent of all tracts).

When the occupation and education factors for tracts 1 and 16 are converted to standard scores, we find that tract 1, with an occupation ratio of 642.7791, receives a standard score of 5.9324, while 16, with a ratio of 166.5804, receives a standard score of 100. A score of 100 means that tract 16 has the fewest number of residents classified as laborers, operatives, or craftsmen of any census tract on the sheet, with the scoring arranged to reflect the value judgment that the fewer the number of laborers, operatives and craftsmen in a tract the higher the economic status of that unit.

FIGURE 3. SAA ECONOMIC INDEX

Census tract	Occupation		Education		Economic index
	Ratio	Std. score	Ratio	Std. score	
1	642.7791	5.9324	434.2468	28.6723	17.302 -1
2	584.2244	17.4993	354.4380	46.5572	32.028 -2
3	658.7029	2.7869	495.2849	14.9938	8.890 -1
4	663.4189	1.8553	536.9531	5.6561	3.756 -1
5	576.6870	18.9882	562.1926	0.0000	9.494 -1
6	624.9143	9.4614	497.8335	14.4227	11.942 -1
7	556.2031	23.0345	468.5586	20.9831	22.009 -1
8	366.8831	60.4325	418.6240	32.1733	46.303 -2
9	608.3105	12.7413	477.4692	18.9863	15.864 -1
10	463.2239	41.4015	291.4524	60.6720	51.037 -3
11	613.5962	11.6972	384.9197	39.7263	25.712 -2
12	574.9316	19.3349	493.2986	15.4390	17.387 -1
13	500.0000	34.1368	432.9158	28.9706	31.554 -2
14	507.3169	32.6915	438.1443	27.7989	30.245 -2
15	406.1392	52.6779	309.5544	56.6154	54.647 -3
16	166.5804	100.0000	115.9570	100.0000	100.000 -4
17	580.9480	18.1465	316.5193	55.0546	36.601 -2
18	611.9690	12.0186	400.1794	36.3067	24.163 -1
19	535.9609	27.0331	396.4377	37.1452	32.089 -2
20	496.1191	34.9034	428.5713	29.9441	32.424 -2
21	390.9312	55.6821	333.1924	51.3183	53.500 -3
22	289.7031	75.6785	223.9245	75.8048	75.742 -4
23	476.5457	38.7700	370.0786	43.0522	40.911 -2
24	281.0515	77.3876	284.4827	62.2339	69.811 -3
25	458.3333	42.3676	350.7642	47.3805	44.874 -2
26	486.7161	36.7609	500.0000	13.9372	25.349 -2
27	380.6060	57.7217	301.8582	58.3401	58.031 -3
28	437.5962	46.4640	471.6636	20.2073	33.376 -2
29	395.9390	54.6929	364.4443	44.3148	49.504 -2
30	460.3499	41.9693	374.3147	42.1029	42.036 -2
31	557.8181	22.7155	455.8674	23.8272	23.271 -1
32	600.2764	14.3284	420.6763	31.7134	23.021 -1
33	597.0605	14.9636	447.7122	25.6547	20.309 -1
34	528.6755	28.4723	325.5303	53.0353	40.754 -2
35	476.1511	38.8479	273.2798	64.7445	51.796 -3
36	345.6631	64.6243	269.3333	65.6289	65.127 -3
37	339.5249	65.8368	225.6201	75.4249	70.631 -3
38	305.5554	72.5471	199.4060	81.2994	76.923 -4
39	404.9114	52.9205	247.3282	70.5601	61.740 -3
40	445.1997	44.9620	196.8162	81.8797	63.421 -3
41	402.1274	53.4704	298.3674	59.1224	56.296 -3

The education standard score designates tract 16 as a 100 score, while tract 1 receives 28.6723. This 100 score means that of all the tracts, number 16 possessed the lowest proportion of residents with less than an eighth-grade education.

When we combine the education and occupation standard scores for tract 1 and divide by two, the number of factors, we derive an economic index score of 17.302, which is rather low, and the tract receives a number 1 designation, while tract 16's combined and divided score receives an index score of 100 and a number 4 designation.

Figure 4, the familization index, shows that under "fertility ratio" for every 1,000 women between the ages of 14 and 44 in census tract 1, there are 887.9446 children under 5 years of age, while in tract 16 for every 1,000 designated women there are 306.0747 children under 5 years. In the case of children the more there are the more the tract is said to be familized, so the higher the standard score. Thus, tract 1 receives a designation of 95.2145, while 16 is a 0.0000.

Figure 4. SAA FAMILIZATION INDEX

Census tract	Fertility		Women In Labor Force		Single-family dwelling		Family status index
	Ratio	Std. score	Ratio	Std. score	Ratio	Std. score	
1	887.9446	95.2145	314.4822	61.9785	780.2900	80.0612	79.0847 -A
2	775.5662	76.8254	340.1772	52.3170	800.4326	82.8156	70.6527 -B
3	796.7085	80.2851	336.7275	53.6141	592.2163	54.3434	62.7475 -B
4	667.5256	59.1462	302.4739	66.4936	521.7390	44.7060	5677819 -B
5	725.6279	68.6538	377.7239	38.1993	530.1606	45.8577	50.9036 -B
6	825.8601	85.0553	345.3872	50,3580	273.1543	10.7137	48.7090 -C
7	917.1892	100.0000	375.0000	39.2235	246.3884	7.0537	48.7591 -C
8	502.3696	32.1208	477.1321	0.8215	194.8051	0.0000	10.9808 -D
9	762.5730	74.6993	421.8750	21.5984	570.1243	51.3224	49.2067 -C
10	687.1333	62.3547	395.6184	31.4709	819.2295	85.3859	59.7372 -B
11	868.2205	91.9870	336.5442	53.6831	797.7161	82.4441	76.0380 -A
12	639.9490	54.6337	346.6577	49.8803	604.3955	56.0088	53.5076 -B
13	569.2598	43.0664	339.5889	52.5383	603.2195	55.8480	50.4842 -B
14	620.3472	51.4261	348.0391	49.3609	458.7412	36.0915	45.6262 -C
15	495.4441	30.9875	414.0127	24.5546	427.4753	31.8161	29.1194 -C
16	306.0747	0.0000	327.1570	57.2127	926.1016	100.0000	52.4042 -B
17	760.7449	74.4001	356.1965	46.2937	803.2520	83.2011	67.9650 -B
18	525.7729	35.9504	379.4253	37.5596	736.6816	74.0980	49.2027 -C
19	528.6819	36.4264	366.6956	42.3460	815.6565	84.8973	54.5566 -B
20	524.1633	35.6870	345.7249	50.2311	702.5920	69.4365	51.7849 -B
21	446.4788	22.9751	392.9246	32.4838	693.9810	68.2590	41.2393 -C
22	504.8354	32.5243	370.1187	41.0589	710.4722	70.5141	48.0324 -C
23	539.3257	38.1681	367.7417	41.9527	599.5422	55.3451	45.1553 -C
24	548.1926	39.6191	365.4773	42.8041	589.4519	53.9653	45.4628 -C
25	578.8335	44.6330	405.7141	27.6749	509.5237	43.0357	38.4479 -C
26	670.4543	59.6254	312.1147	62.8686	393.3401	27.1483	49.8808 -C
27	440.6777	22.0258	479.3169	0.0000	523.1479	44.8987	22.3082 -D
28	496.1240	31.0988	355.1401	46.6909	224.8366	4.1066	27.2988 -C
29	472.4263	27.2210	403.5242	28.4983	253.6585	8.0478	21.2557 -D
30	560.8108	41.6838	334.0908	54.6055	562.3440	50.2585	48.8493 -C
31	560.4551	41.6256	298.8762	67.8464	479.0286	38.8657	49.4459 -C
32	594.4517	47.1887	338.1294	53.0870	769.6077	78.6004	59.6254 -B
33	615.9272	50.7029	318.5408	60.4524	527.7410	45.5268	52.2273 -B
34	600.5933	48.1937	328.4534	56.7252	844.8740	88.8926	64.6038 -B
35	622.5264	51.7827	314.6943	61.8987	888.7202	94.8883	69.5232 -B
36	443.4468	22.4789	367.1304	42.1825	888.8887	94.9113	53.1909 -B
37	563.6018	42.1405	363.8496	43.4161	910.7791	97.9047	61.1538 -B
38	509.6582	33.3135	288.9316	71.5856	903.9546	96.9715	67.2902 -B
39	518.8582	34.8189	325.6519	57.7786	919.5906	99.1096	63.9024 -B
40	830.6218	85.8345	302.1226	66.6257	919.1313	99.0468	83.8357 -A
41	516.8809	34.4953	379.0847	37.6877	716.9810	71.4041	47.8624 -C

In relation to working women (figure 4) there are 314.4822 women in the labor force for every 1,000 women over 14 years of age in census tract 1, and 327.1570 in tract 16. Tract 1 receives a standard score of 61.9785 and 16 a score of 52.2127.

The last factor is owner-occupied dwelling units with tract 1 having a ratio of 780.2900 and receiving a standard score of 80.0612 and 16 a ratio of 926.1016 and a score of 100.

As in the case of the "Economic Index," we add a given tract's standard scores together and divide by the number of factors, three in this case, to obtain the designation for the index of family status. Again, the 0-100 index is divided into parts identical to the Economic Index, but the designations are now alphabetic with 0-24 the lowest portion, labeled D, and the highest portion, 75-100 labeled A.

Thus, for the purposes of family status tract 1 is an A tract, while tract 16 is B.

If, at this point, you feel this technique is quite complicated, imagine the complexity of having to use 19 variables instead of the 5 we employed in the economic and familization indexes.

All that we have done is describe four levels of economic status—1 being low and 4 being high—on the basis of occupation and education. Next, we have described four levels of familization—D being low and A being high—on the basis of number of children, women in the labor force, and single-family dwelling units.

Next we can further reduce the data by combining these levels of status into one easy-to-read table (fig. 5). In one glance the table allows us to see the overall socioeconomic profile of any census tract. For example, in tract 1 we have an economic index designation of 17.302 or a 1, and an index of family status of 79.0847 or A. Therefore, the SAA score of census tract 1 is 1-A.

Figure 5. Social Area Key

Census tract	Economic index	Economic rank	Family rank	Family index
1	17.302	1	A	79.0847
2	32.028	2	B	70.6527
3	8.890	1	B	62.7475
4	3.756	1	B	56.7819
5	9.494	1	B	50.9036
6	11.942	1	C	48.7090
7	22.009	1	C	48.7591
8	46.303	2	D	10.9808
9	15.864	1	C	49.2067
10	51.037	3	B	59.7372
11	25.712	2	A	76.0380
12	17.387	1	B	53.5076
13	31.554	2	B	50.4842
14	30.245	2	C	45.6262
15	54.647	3	C	29.1194
16	100.000	4	B	52.4042
17	36.601	2	B	67.9650
18	24.163	1	C	49.2027
19	32.089	2	B	54.5566
20	32.424	2	B	51.7849
21	53.500	3	C	41.2393
22	75.742	4	C	48.0324
23	40.911	2	C	45.1553
24	69.811	3	C	45.4628
25	44.874	2	C	38.4479
26	25.349	2	C	49.8808
27	58.031	3	D	22.3082
28	33.376	2	C	27.2988
29	49.504	2	D	21.2557
30	42.036	2	C	48.8493
31	23.271	1	C	49.4459
32	23.021	1	B	59.6254
33	20.309	1	B	52.2273
34	40.754	2	B	64.6038
35	51.796	3	B	69.5232
36	65.127	3	B	53.1909
37	70.631	3	B	61.1538
38	76.923	4	B	67.2902
39	61.740	3	B	63.9024
40	63.421	3	A	83.8357
41	56.296	3	C	47.8624

On the other hand, census tract 16 has an economic index of 100, or 4, and an index of family status of 52.4042, or B. Thus tract 16 has an SAA score of 4-B.

If we were to describe the economic and familization differences between tracts 1 and 16 based on the Social Area Key we could say that residents in tract 1 tend to be laborers, operatives, and craftsmen, with less than an eighth-grade education; while residents of tract 16 tend to work in capacities other than those prevalent in tract 1, such as secretarial, sales and professional, and tend to be educated beyond the eighth-grade level.

As regards familization differences, we know that for "family rank", on the Social Area Key, tract 1 scores a 79.0847, placing it in the highest category and receives an A designation. While tract 16 scores only 52.4042, making it a B. In reviewing the two tract's familization scores we discover that the standard scores for women in the labor force and owner-occupied dwellings are not significantly different. In terms of familization the only significant difference is the number of children under 5 years of age in relation to women between the ages of 14 and 44 years. When the three standard scores are combined and divided, naturally, census tract 1 receives a higher index of family status because of its higher fertility standard score.

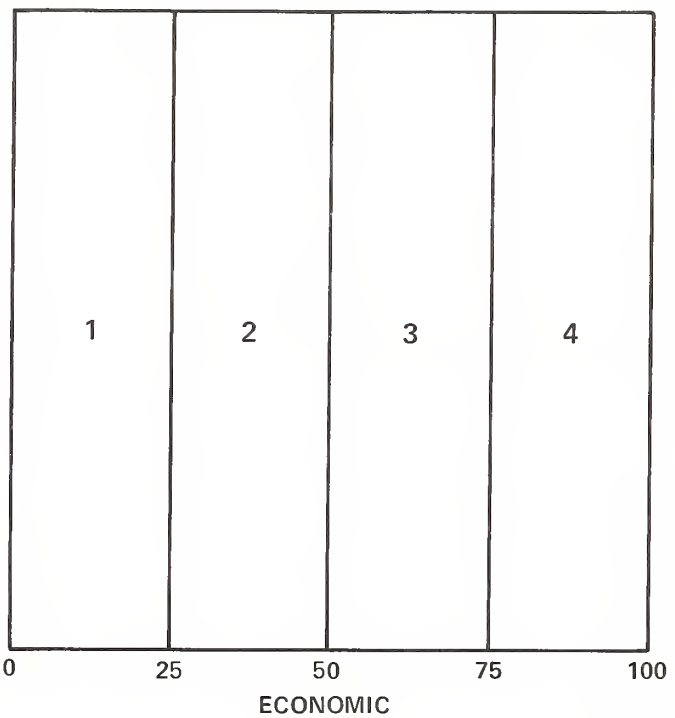
Therefore, if we were describing the familization differences between the two census tracts, we would say that residents in census tract 1 tend to have many young children in their families. The women tend not to hold jobs, and families usually own their housing units. Residents of tract 16 almost always reside in owner-occupied units, the women tend not to hold jobs, and there are usually no children under 5 years of age in that tract's households.

Based on our description of the two tracts it is possible to assume that the resident's needs and concerns may differ considerably, and a recognition of this difference and the factors which cause it can be of crucial importance for effectively dealing with each tract's problems.

A method of illustrating the relationships between economic and familization status and highlighting the differences between census tracts is to construct a two-variable matrix.

In Figure 6, Economic Index Key, there are four boxes.

FIGURE 6. ECONOMIC INDEX KEY



From left to right, each box represents a range of the 0 to 100 economic standard scores (box 1 = 0 to 24, box 2 = 25 to 49, box 3 = 50 to 74, and box 4 = 75 to 100).

On the other hand, in Figure 7, Familization Index Key, the boxes, A, B, C, and D, represent the range of the familization standard scores. (Running from bottom to top: Box D = 0 to 24, box C = 25 to 49, box B = 50 to 74, and box A = 75 to 100.)

FIGURE 7. FAMILIZATION INDEX KEY

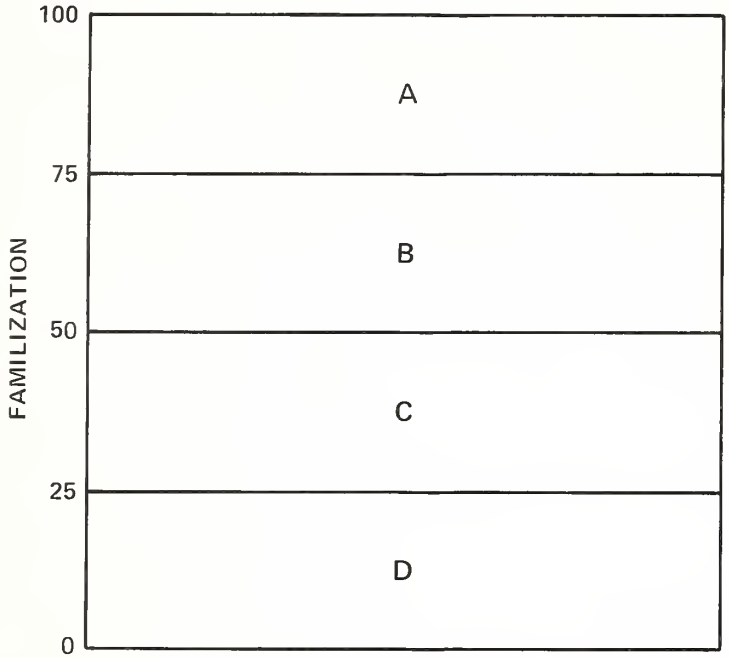
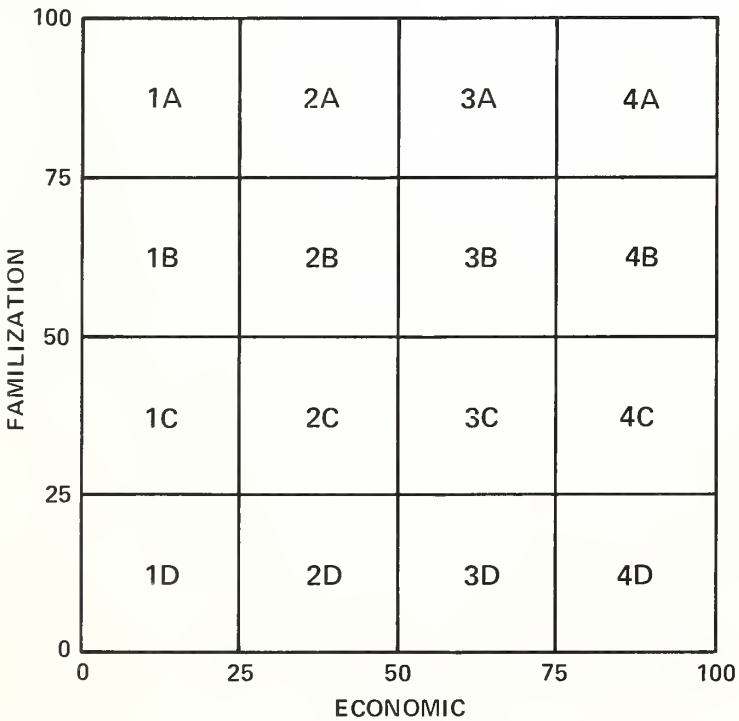


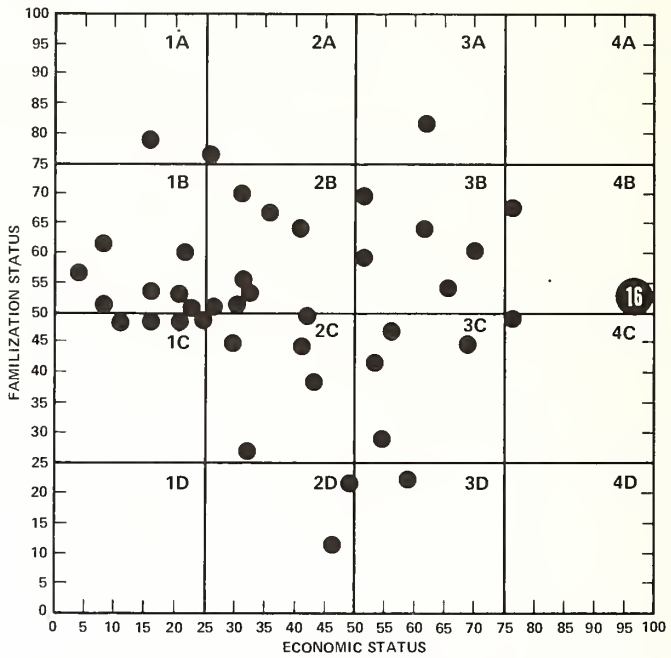
FIGURE 8.



When the two indices are combined into the social area typology, figure 8, it can be seen that there are 16 different types of census tracts based on economic and familization status.

Now, how do we relate the 41 census tracts of Center City to the social area typology? Actually, it's quite simple (fig. 9).

FIGURE 9. SOCIAL AREA INDEX OF CENTER CITY



We have placed the 100-point economic index on a horizontal scale and the 100-point familization index on a vertical scale. Let's take census tract 16 again. The economic score of census tract 16 is 100; so we move to 100 on the economic index (horizontal scale). Tract 16 scores 52.4 on the familization index (vertical axis) so we move up to 52 and place the number 16 at that point. Additionally, we know that 100 equals 4 in economic status and 52.4 equals B in familization status; therefore, census tract 16 is a 4-B census tract.

At this point we have taken our census tract book of Center City and reduced it to one typology, based on five characteristics, which relates the economic and familization status of all the census tracts in Center City. Clearly, we have moved quite a way on our scale towards "easy to use." In fact, we can now quantify how far we have moved along the scale. Let me briefly review the exact extent to which we have condensed the original tract data. First, we took our census tract book with all of its 32 detailed characteristics of each of the 41 census tracts creating 1,312 data items. We made some subjective judgments and decided to use only those variables that social scientists have used in previous studies. This activity provided us with two key categories of data (actually three categories when ethnicity is utilized): economic and familization status. At that point we were working with 10 economic variables and 9 familization variables in each of our 41 census tracts—in all, 779 data items.

10 economic variables	x	41 census tracts	=	410 data items
9 familization variables	x	41 census tracts	=	369 data items
19 variables	x	41 census tracts	=	779 data items

We systematically determined which variables in our two concepts most efficiently described each of our concepts. We found that economic status could be described by education and occupation characteristics, and that familization status could be

described by fertility, working women, and home ownership characteristics. By this further reduction we were now dealing with two economic variables and three familization variables in each of our 41 census tracts—in all 205 data items.

2 economic variables	x	41 census tracts	=	82 data items
3 familization variables	x	41 census tracts	=	123 data items
5 variables	x	41 census tracts	=	205 data items

We normalized these variables within each concept by placing them on a standard score scale of from 0 to 100. From this procedure we derived one index score for each of our two concepts in each of our 41 census tracts—in all 82 data items.

1 economic index	x	41 census tracts	=	41 data items
1 familization index	x	41 census tracts	=	41 data items
2 indices	x	41 census tracts	=	82 data items

Finally, by collapsing the 100-point indices into four categories and assigning alphabetic and numeric designations, we combined the four categories for each concept and created 16 possible positions within a matrix, allowing us to place each of our 41 census tracts in a "social space" describing economic and familization relationships.

In developing this easy-to-use typology, have we, in fact, traded off accuracy? The answer is yes and no. Let's look first at the economic status index of census tract 16 (fig. 3). We see that census tract 16 ranks highest in economic status with a score of 100. This implies, if we have not lost any accuracy, that census tract 16 should rank among the highest tracts in all of our economic variables. We know already, in the case of our two "most efficient" variables, occupation and education, that it ranks highest. But what about the other variables? Does our economic status index accurately really reflect them? The census tract data book contains the information necessary to verify our theory. Plotting all the relevent economic characteristics of tract 16 would have yielded the following results:

VARIABLE	RANK
Income	1st
Persons per room	1st
Type of heating fuel	2nd
Contract monthly rent	No Renters
Value of owner-occupied dwellings	1st
Condition and plumbing facilities	2nd

In fact, for census tract 16 we have developed an index which is easy to use and one in which we have lost very little accuracy, while eliminating unnecessary and cluttering detail. In other words, the economic index is an excellent index of economic status in Center City.

Let's look now at familization status. The index is 52.4—almost the median point (23 tracts below and 17 tracts above). However, a review of the standard scores of the elements which contributed to the index number 52.4 reveals that census tract 16 is not at all in the middle, relative to its familization variables. In this case, census tract 16 has the lowest fertility ratio and the highest owner-occupied dwelling unit ratio and is in the highest third of all tracts relative to women not working. Yet, when we look only to the index, we are left with the impression that census tract 16 is about at the mid-point of familization status. Clearly, in this case, we have lost accuracy as we moved toward the easy-to-use side of our scale.

VARIABLE	STD. SCORE	RANK
Fertility	0.0	Lowest
Women not in labor force	57.2	Third highest
Single-family dwelling units	100.0	Highest
	157.2 ÷ 3=52.4	

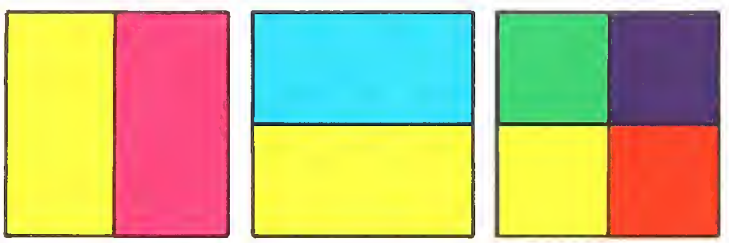
From a decisionmaker's point of view, however, it is important to note that there was sufficient detail in the presentation of figure 4 to reflect that deficiency in the index. This example highlights the responsibility of the provider of information to present the decisionmaker with sufficient, detailed information and methodological explanation to enable him to determine how much confidence he can place in the data.

Although we have certainly reduced the volume of data items to manageable proportions, we haven't yet made our supervisor's map. Remember, he said he wanted an overview of Center City in no more than 10 maps. Well, since he's so busy, let's see if we can do it all in one map.

To accomplish that we will use the three primary colors—red, blue, and yellow—to relate the two concepts of economic and familization status. Let me first illustrate how these primary colors relate to the color spectrum.

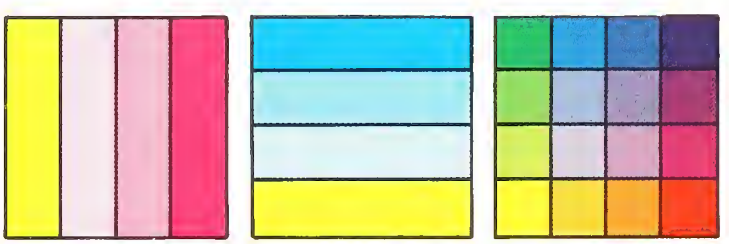
If we take two vertical bars of yellow and red, and blend them with two horizontal bars of yellow and blue we will produce the four squares of purple, orange, green and yellow (fig. 10).

FIGURE 10. COLOR-CODED CONCEPT



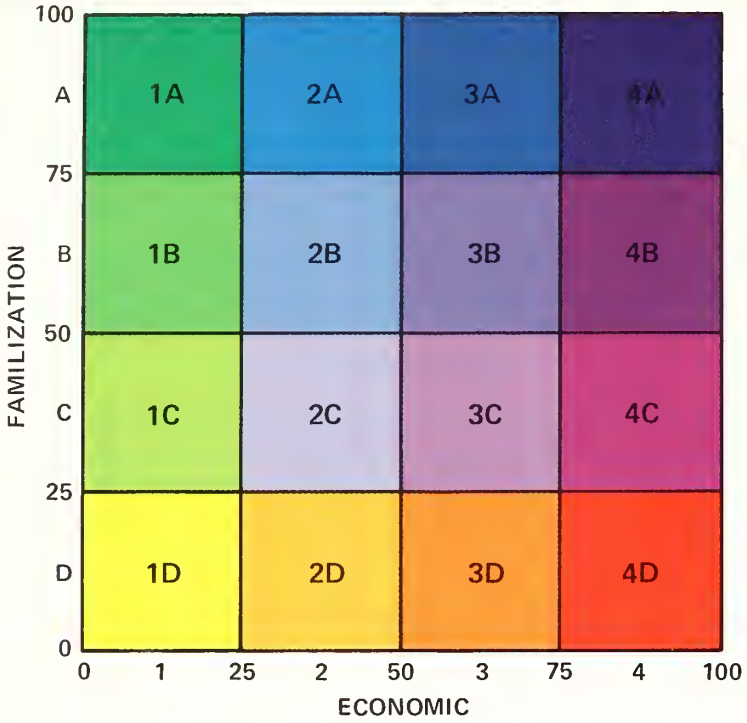
Using the same colors, but, in this case separating the vertical red bar into three shades of red and the horizontal blue bar into three shades of blue, we blend the vertical and horizontal bars in the same way, creating a four by four matrix of 16 squares of different colors and shades. In the corners of our matrix we find the same purple, orange, green and yellow colors that we generated when we blended the two vertical and horizontal bars of primary colors. The basic difference between the 4-color matrix and the 16-color matrix is the tones that are created when we shade the blue and red (fig. 11).

FIGURE 11. COLOR-CODED MATRIX

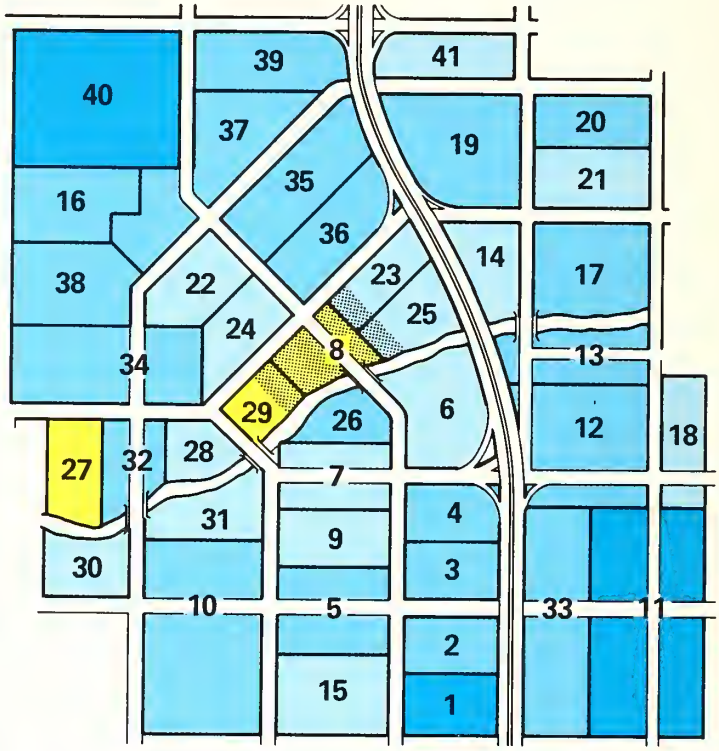


Now, how do we relate this color-coding technique to the map we must make for Center City? Lets go back to figures 6 and 7 where we developed the economic index key and the familization index key by dividing their respective indices into quadrants. In figure 12 we use the same index keys but we color-code them.

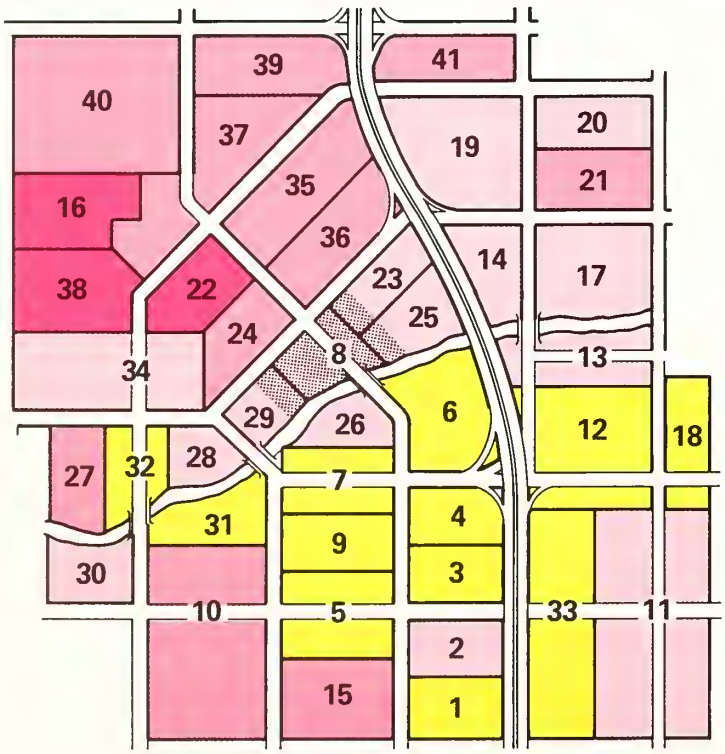
FIGURE 12. COLOR-CODED SOCIAL AREA INDEX



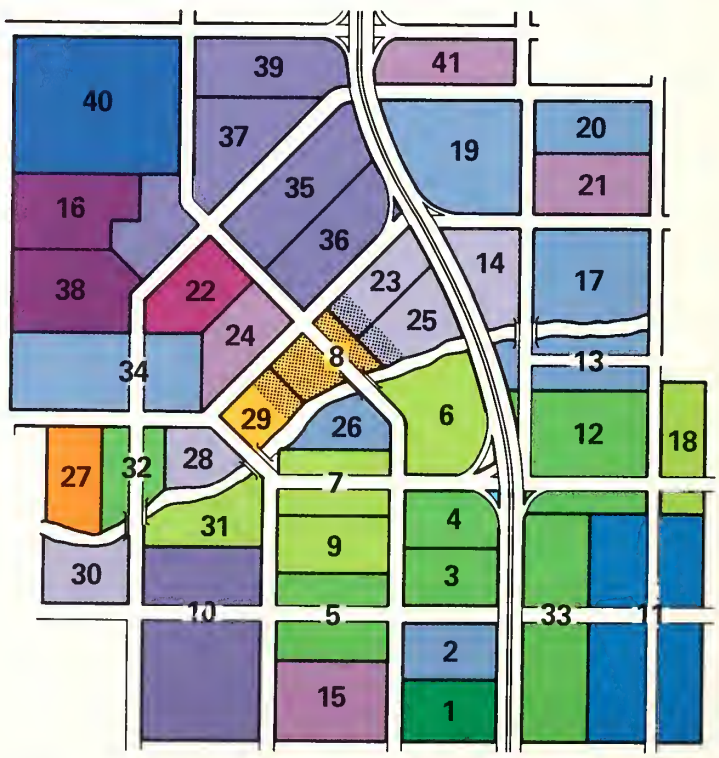
MAP 2. CENTER CITY FAMILIZATION PROFILE



MAP 1. CENTER CITY ECONOMIC PROFILE



MAP 3. CENTER CITY SAA PROFILE



In map 1 we take the lowest economic status (1) and color it yellow. The second lowest (2) is color-coded light red, the second highest (3) is color-coded medium red and the highest economic status (4) is color-coded dark red. In map 2 we take the lowest familization (D) and color-code it yellow. The second lowest (C) is color-coded light blue, the second highest (B) is color-coded medium blue, and the highest familization status (A) is color-coded dark blue. These two maps show us where the different types of persons, as identified by their economic and familization status, are located in Center City. As far as economic status is concerned, the higher economic census tracts are located north of the river and clustered together. As far as familization status is concerned, the lowest familization is located in the center of the city, and as you develop concentric circles further from center city, familization status gets higher.

So, now we have two maps which should provide your supervisor with an excellent overview of Center City. And, if you wish, we can blend the two maps together creating map 3, which,

in one map, provides an excellent overview for your supervisor's use.

The Census Bureau's geography staff has recently developed the ability to produce full-color, cross-classification maps using computerized mapping techniques and COM (Computer Output on Microfilm) units. Because of the reduction in costs and time, this new map-making ability opens up a variety of analytic uses not before feasible.

Now let's see how this relates to relevant census information. In map 4 we have color-coded, using red and yellow, the average size of the farms in the 3,000 counties within the contiguous 48 States. Yellow indicates those counties where the average size of farms is less than 50 acres. The next classification is represented by light red and illustrates counties where farms average 50 to 199 acres. Medium red represents counties where farms average 200 to 499 acres. The dark red areas are counties where farms average 500 or more acres. As you can see, although there is great variety in the size of American farms, there tends to be a geographic clustering of the different-size farms. The large yellow area in the mid-section of the eastern United States contains over half of all the Nation's farms of 50 acres or less. Most of these farms are family farms operated by part-time farmers. The larger farms, particularly large wheat farms, some as large as 2,000 acres, are found in the midwest and western parts of our country.

Map 5 shows the average value of all agricultural products sold per farm in each of the 3,000 counties. The yellow indicates counties where farms average under $5,000 in the value of products sold. The light blue represents average sales of $5,000 to $19,999. The medium blue represents counties with average sales of $20,000 to $39,999, and the dark blue reflects average sales of $40,000 or more.

At this point, one might hypothesize that the dark blue areas, representing the highest average value of products sold per farm, would tend to be located in the dark red areas, representing the largest farms. Additionally, we would not expect to find green areas which would be the combination of blue (high average values) with yellow (small size) or orange areas, which would be the combination of red (large size) with yellow (low average values).

How does our hypothesis stand the test? Well, first, map 6 clearly illustrates that the size of farm and the average value of agricultural produce sold are not necessarily related. In fact, there are many areas of our country (represented by green) in which the smaller farms (yellow) have high average values of product sold (blue). In fact, the products of the small farms—vegetables in the northeast around New York City, specialized orchards in the Michigan area, and tobacco in North Carolina—rather than the sizes of the farms, affect average value in dollars.

Using computer output and microfilm plotting devices, the Census Bureau can produce these types of maps quickly and inexpensively. The low cost and short preparation time of these new techniques now make it possible for the research analyst to prepare many graphic displays to test the validity of various data relationships, or more clearly identify particular geographic areas of interest or concern. Our eventual goal is to make this mapping technique available at the census tract level, as well as the county level. This next set of charts is an example of the maps which will be produced in our forthcoming Urban Atlas.[5]

In map 7 we have color-coded the census tracts of the Fort Worth SMSA according to the median income of all the families in each tract. The yellow area represents census tracts of $7,000 income or less; the light red, $7,000 to $9,999; the medium red, $10,000 to $14,999; the dark red, $15,000 or more.

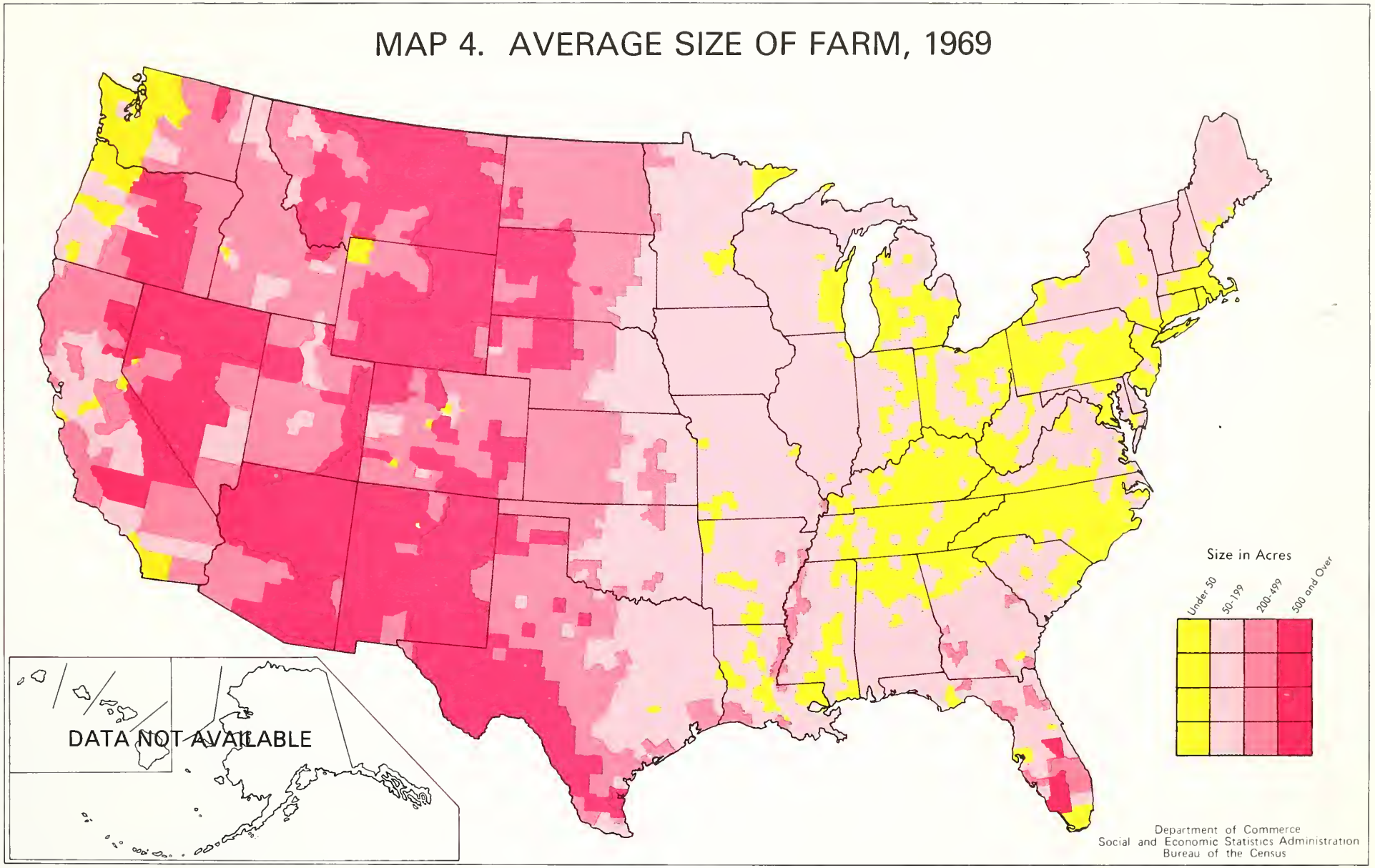
Map 8 shows the percentage of the adult population which has graduated from high school. The yellow area represents tracts where less than 35 percent of the adults have graduated from high school; the light blue represents 35 to 64.9 percent; the medium blue, 65 to 84.9 percent; and the dark blue, 85 percent or more of the adults have completed 12 or more years of education. The blending of these two maps (map 9) illustrates the relatively strong correlation between median family income and completion of 12 years of education.[6] However, there are green and orange areas in which the percent of high school graduates does not seem to affect the median family income. From an analytic point of view, these might merit further investigation to determine why these two characteristics are not related in those areas.

In conclusion, I want to stress that the concepts we have discussed are preliminary, and there is still a tremendous potential to be developed in the graphic presentation of statistics. For example, in this presentation I have made no mention of the psychological aspects of presenting graphics, another aspect still in its fledgling stages. At this point, we have little knowledge of how often decisionmakers misinterpret graphic displays, or how often such presentations are rejected out of hand. However, in a period of history such as ours, there can be little doubt that accurate, relevant, timely, complete, and easily comprehensible data are essential. I would respectfully submit that our discussion affords an overview of the unique possibilities offered by graphic displays.

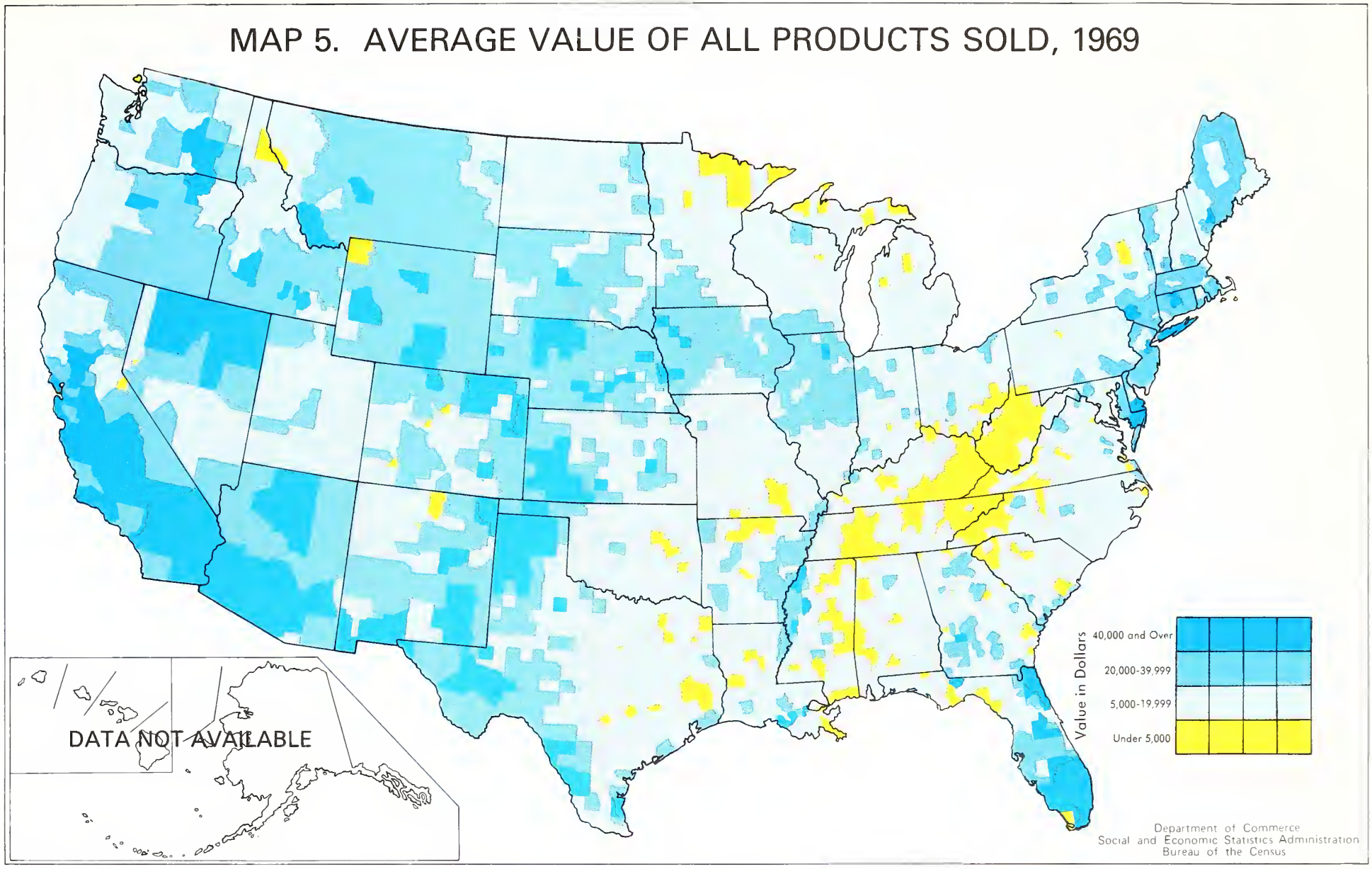
[5] **Urban Atlas**, Series GE-80, U.S. Bureau of the Census and Manpower Administration, U.S. Government Printing Office, Washington, D.C., 1974.

[6] See also, Dr. Richard Wirthlin's discussion of the ecological fallacy (p. 81).

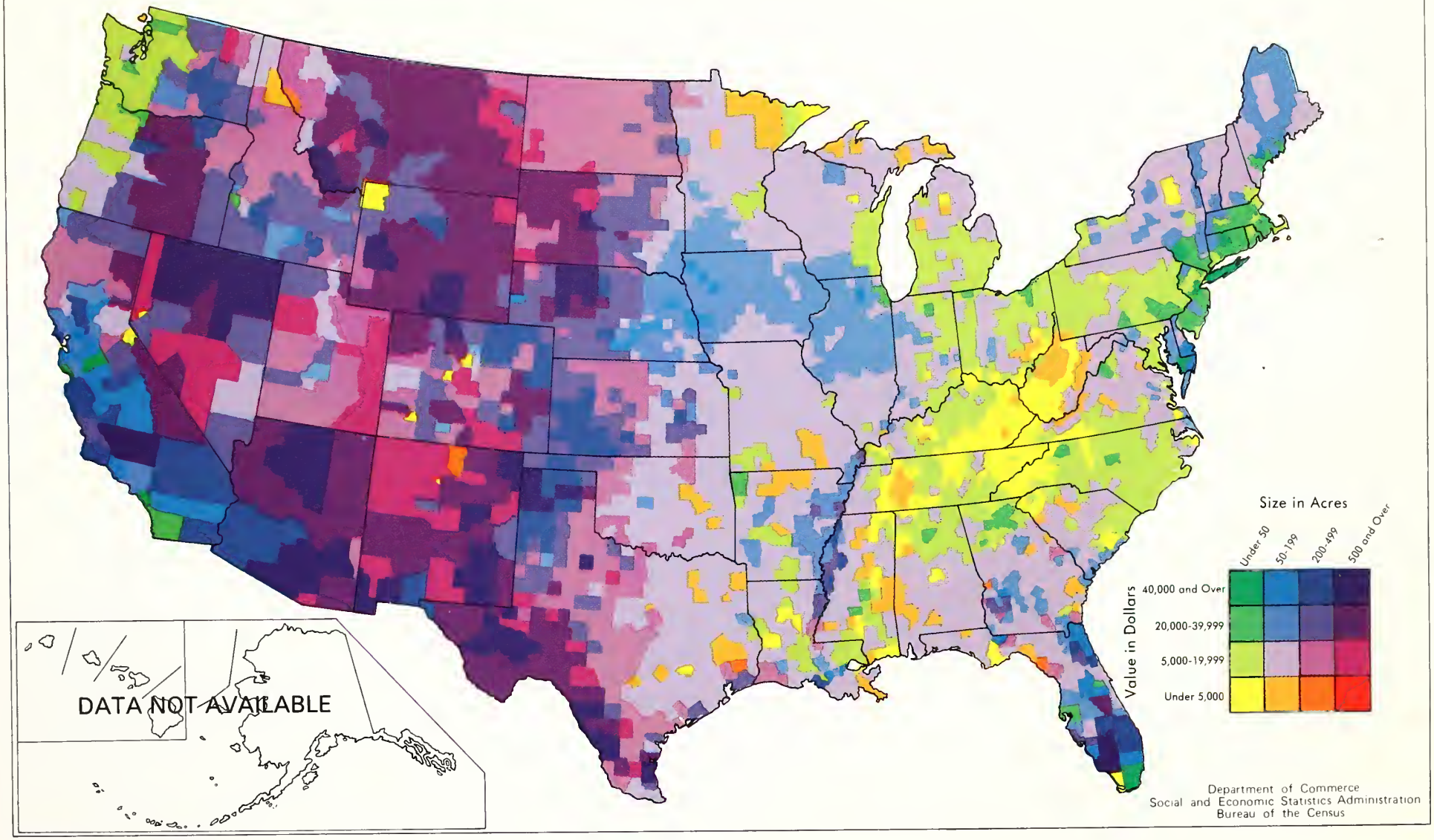
MAP 4. AVERAGE SIZE OF FARM, 1969

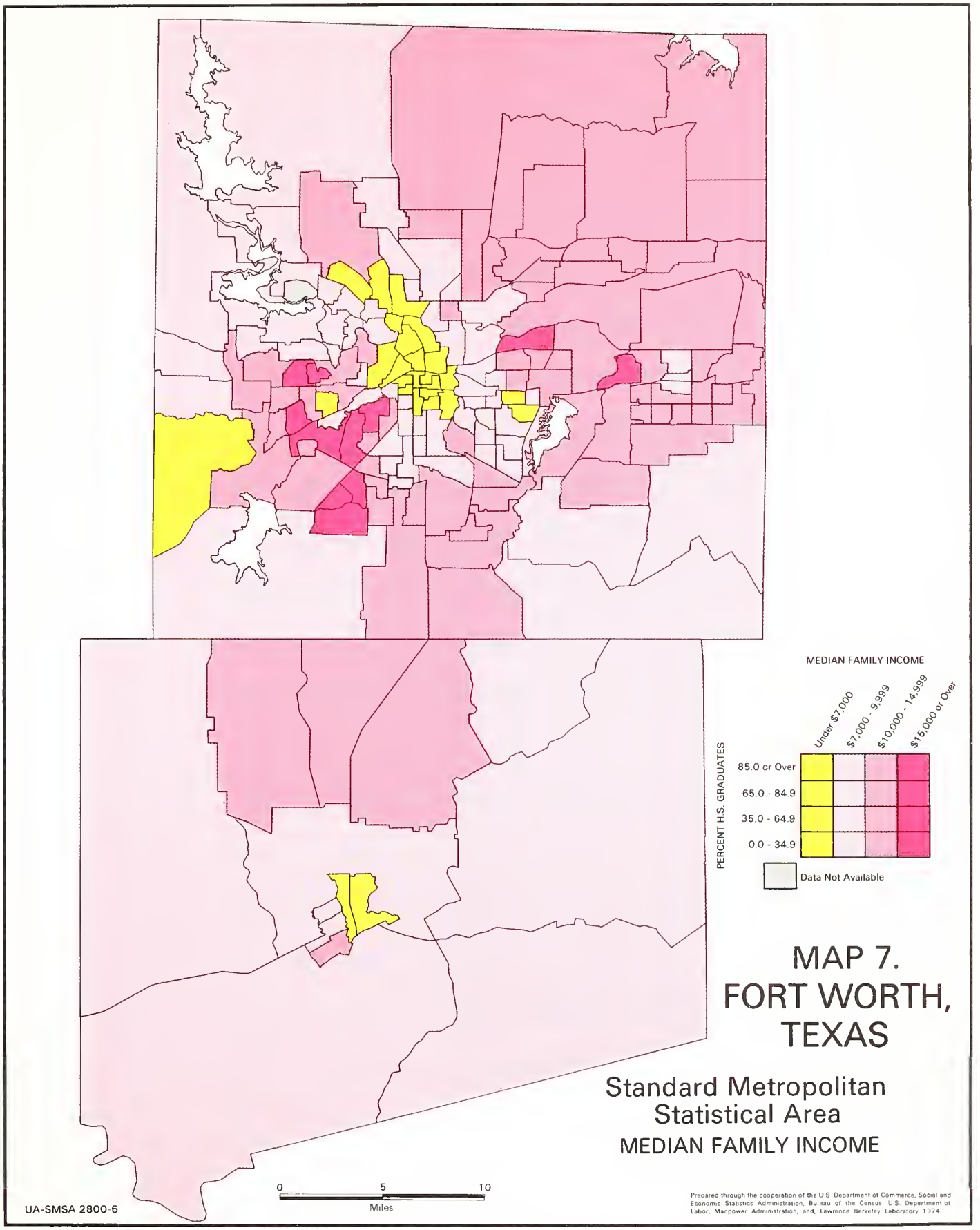


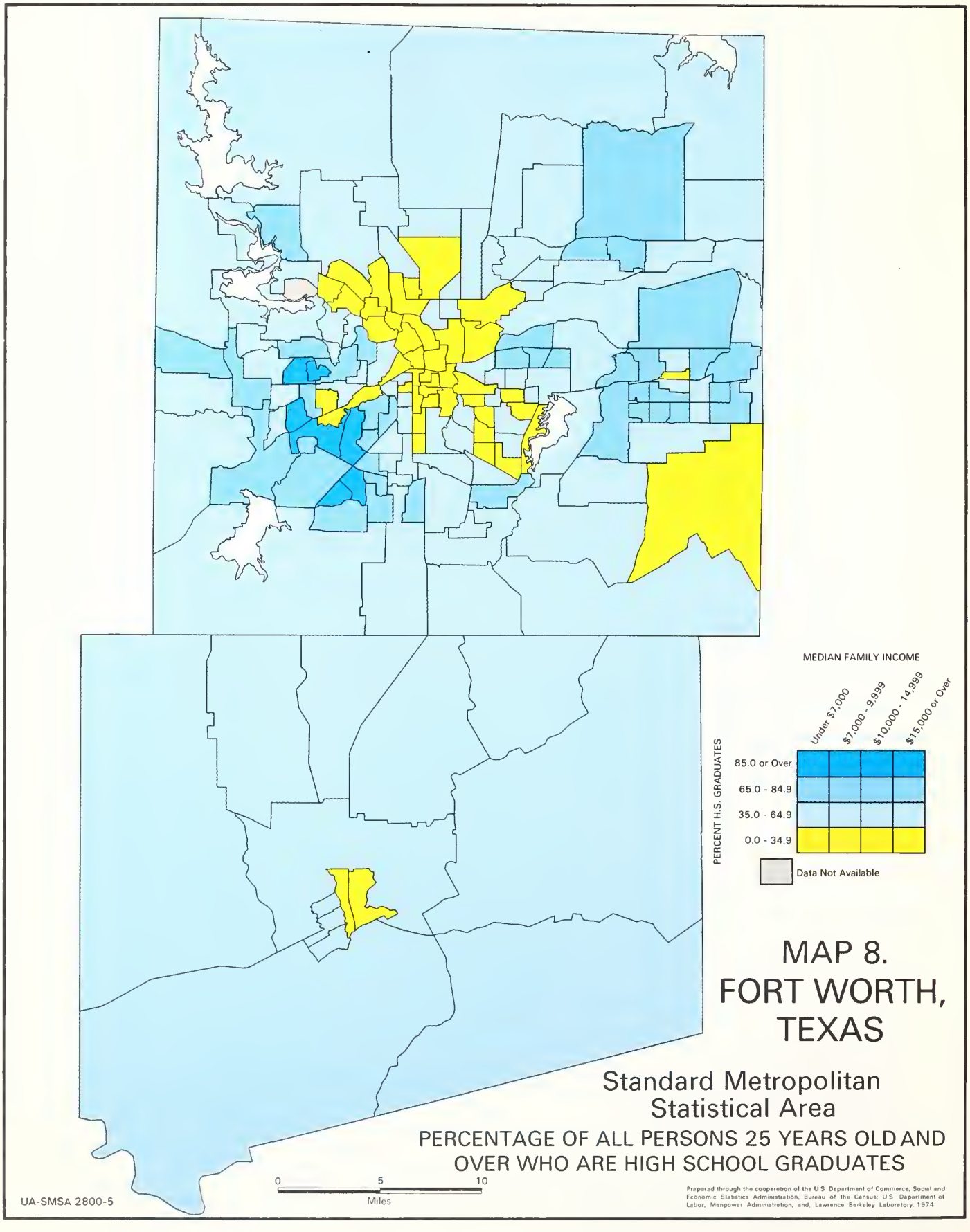
MAP 5. AVERAGE VALUE OF ALL PRODUCTS SOLD, 1969

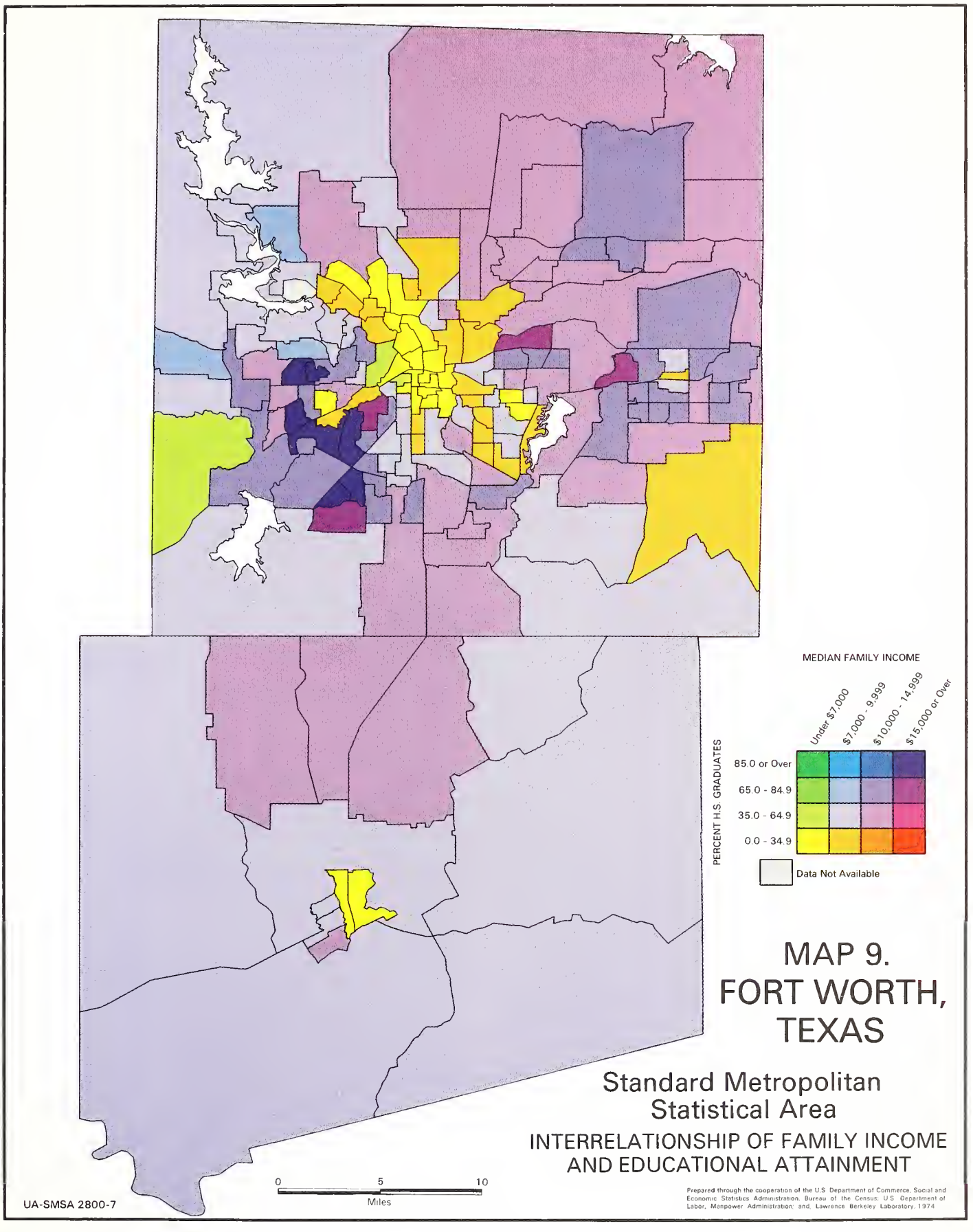


MAP 6. AVERAGE VALUE OF ALL PRODUCTS SOLD TO SIZE OF FARM




MEDIAN FAMILY INCOME
Under $7,000
$7,000 - 9,999
$10,000 - 14,999
$15,000 or Over
PERCENT H.S. GRADUATES
85.0 or Over
65.0 - 84.9
35.0 - 64.9
0.0 - 34.9
Data Not Available
MAP 7.
FORT WORTH, TEXAS
Standard Metropolitan Statistical Area
MEDIAN FAMILY INCOME
0
5
10
Miles
UA-SMSA 2800-6
Prepared through the cooperation of the U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census U.S. Department of Labor, Manpower Administration, and, Lawrence Berkeley Laboratory 1974


MEDIAN FAMILY INCOME
Under $7,000
$7,000 - 9,999
$10,000 - 14,999
$15,000 or Over
PERCENT H.S. GRADUATES
85.0 or Over
65.0 - 84.9
35.0 - 64.9
0.0 - 34.9
Data Not Available
MAP 8.
FORT WORTH, TEXAS
Standard Metropolitan Statistical Area
PERCENTAGE OF ALL PERSONS 25 YEARS OLD AND OVER WHO ARE HIGH SCHOOL GRADUATES
0
5
10
Miles
UA-SMSA 2800-5
Prepared through the cooperation of the U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census; U.S. Department of Labor, Manpower Administration, and, Lawrence Berkeley Laboratory, 1974



MAP 9. FORT WORTH, TEXAS

Standard Metropolitan Statistical Area

INTERRELATIONSHIP OF FAMILY INCOME AND EDUCATIONAL ATTAINMENT

Prepared through the cooperation of the U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census; U.S. Department of Labor, Manpower Administration; and, Lawrence Berkeley Laboratory, 1974

THE CENSUS FUNCTION

Daniel B. Levine, Associate Director for Demographic Fields, U.S. Bureau of the Census.

"Most people working in this area feel that social indicators provide us better answers than we would have without them, if only as a basis for decisionmaking or, at best, that they influence the overall climate of opinion . . . . The Census Bureau would like to get the most accurate data it possibly can. On the other hand, the Census Bureau is not '1984.' "

Daniel Levine

Mr. Barabba: This morning we're going to discuss a little bit more about the Census Bureau. We have with us Dan Levine, the Associate Director for Demographic Fields. What "Demographic Fields" means, basically, is the area of the Census Bureau that uses as its unit of measurement either a person or a household.

Mr. Levine: I'm really here under somewhat false pretenses, in that the theme of this series of lectures is social indicators. I think I have a little bit of understanding in this area, but certainly I am far from being an expert in the field.

Before you pick up your books and papers and decide to leave, I do have a few things that I'd like to share with you today, much of which forms the background for the topic of social indicators. I really would like to give you my understanding of social indicators—a little bit of what I think they are, what they ought to be, what the problems are in using them, what people here and elsewhere are doing in the general area of social indicators, and what the Census Bureau is doing, generally, in trying to help with their development.

By now you have heard several definitions of social indicators. Let me give you mine. Social indicators, as I understand them, are a time series of social and demographic measures, a series of quick snapshots over time, a series of dial readings which provide social policymakers with an understanding of what's going on. I think the key that describes the term "social indicator" is the idea of a "time series." A snapshot of any one point in time is certainly useful, but by itself it has very little utility because it doesn't tell you whether you're moving up a scale or riding on a flat plane. It's very difficult to call something a social indicator if you only have one observation, or one snapshot. You need to have an objective and to be able to measure whether you are moving toward it. That's the key point that I want to make.

The second point is in relation to the problems that people have in talking about social indicators. Notwithstanding the goal that everybody's seeking, no one yet has developed what is desired—a single comprehensive measure that could be described as the social indicator equivalent to the GNP, the latter being generally considered the single composite measure of economic indicators.

Instead, you have a series of different indicators. Despite all the component pieces, nobody has yet developed what you could call a single comprehensive measure of what's happening to health in our Nation, or what's happening as regards social equality, educational performance or the overall aspiration of our people. In other words, there is no index of the quality of life.

A number of social scientists have raised useful questions about social indicators. Many persons attempting to develop social indicators stress the problem of the supply of social information. But far too little attention is really being paid to how a growing supply of technically improved information could or should be used by citizens, policymakers, and public officials.

A second problem is that indicators, although of general interest, may not be useful to specific users, each of whom might best be served by a variety of different measures. For example, take the police chief, the precinct captain, and civic groups who are worried about police matters, and political leaders who develop programs and pass legislation. All these people want to appraise the war against crime, yet each may require a different measure.

A final point is that an indicator tends to be most useful to producers of public goods and services rather than to the consumers of these items. For example, there are indicators that are used by school officials or health planners to tell them the best utilization of health manpower, school manpower, or dollars spent. But, how do you judge the competence of physicians if you happen to be someone who's a patient rather than another doctor? You may have measures of the time it takes a physician to see a number of patients, and how much it costs to train him. But there's a problem as to how social indicators meet the needs of the ultimate user rather than the producer.

I hasten to add that these reflections are not ideas that I made up, rather, they are contained in a recent report of the Urban Institute. It describes a 2-year program through which they are trying to develop some methodology and determine how useful social indicators can be and how best to structure social indicators so policymakers at all levels can use them. There even are some heretics who believe the development of adequate theoretical underpinnings for social indicators is the most important requirement. They argue that people are zealously developing social indicators but very few people have really stopped to develop a theory of how the indicators interrelate, how they should be used, and what they should be used for.

After one looks at all these caveats a single point still comes up, namely, that most people working in this area agree social indicators provide us better answers than we would have without them, if only as a basis for decisionmaking or, at best, that they influence the overall climate of opinion.

Several facts seem certain. There aren't enough data to meet all the needs that people seem to express which is amazing when you contemplate all of the statistics we have. The fact remains when people start looking for pertinent data regarding a social problem, invariably what they need is missing. A very good example is crime. Crime existed before the earliest law codes. But

there weren't a lot of statistics on crime until it was determined a very important social issue, necessitating the development of public policy and appropriation of public funds. Then, and only then, did someone say, "Where are the statistics which will help us develop the programs we need, statistics which will enable us to measure over time where we're going, where we've been, and whether we are meeting the objective we set for ourselves?" Every scientist will tell you there is unfortunately not enough data around.

The second point is that social indicators are here to stay. What's going to happen now is that people are going to try to develop bigger and better social indicators and hopefully find the underpinning to the general social theory that I mentioned.

This leads me to the point that social indicators are not solely the concern of the United States. They are of interest throughout the entire world. Most of the countries in Europe, both through their own efforts and in conjunction with the Organization for European Economic Cooperation and Development, have gone a long way toward committing themselves to a continuing program of developing and publishing social indicators of one sort or another.

The important development here is that these nations started from a very favorable point of attack. They agreed they would try to establish common denominators so that in attempting international comparisons one would have a common framework or set of definitions. Hopefully, there also would be a common set of measures so that comparisons could be made as to what was happening in the health field in these different countries. That type of comparative information could serve as a basis for seeing if the programs that they have applied would meet other nations' goals instead of worrying more about conceptual differences to explain away discrepancies in the levels of the social indicators.

The following table lists the social concerns that five countries—the United States, Great Britain, France, Sweden, and Norway—have agreed upon.

In looking at the table it is rather apparent that basically the same eight topics appear in all of the reports under more or less the same names: Health, safety, education, employment, income, housing, leisure and recreation, and population. You'll notice that some countries have a few more, some countries a few less. These are the social concerns which social scientists from these countries have discussed in concert, the basic concerns that they want to attack in terms of developing social indicators that can help society to understand these problems.

These categories are interesting in that the countries started off their research individually and through their own efforts came to roughly this grouping. When they got together and decided to discuss and rank-order them, there was a startling consensus. This is particularly impressive when you deal in the international sphere, where each country has its own political and social philosophy and national objectives. This consensus now extends to Japan and a number of the countries in central Europe, including some behind the Iron Curtain where the social philosophy is obviously quite different. There is one area which is left out of the United States' report called "social services," "social welfare," or "social benefits," as you see reported elsewhere.

You have in front of you the report put out by the Office of Management and Budget, **Social Indicators 1973.** In talking with the people who worked on it and having participated to a very limited extent myself, I understand the exclusion of social services in the U.S. report is a result of a decision to report output measures only. Social welfare and social benefits are viewed as input measures. As you can see, there are differences of opinion as to the best approach!

Student: How does the United States compare with Sweden and France who have more variables?

Mr. Levine: As indicated, you'll find these basic eight categories, but you do find in Europe a considerably greater interest in the input measures and in breaking down some of these categories into several component pieces. I think that's the major difference.

In a number of those countries, because of the forms of government and because of the statistical systems, their concerns are quite different. In the Scandinavian countries, as you know, they've had social programs such as health insurance for many years, while we're basically just beginning to scratch the surface of a general health insurance program. Where many European countries have long had social programs with far greater development and participation on the part of their population, plus greater degrees of regulation of the society and the economy, I believe there is a much greater interest on the part of the policymakers to get some measure of the impact those programs are having. The United States has a great deal of interest in social indicators. But it has some national political and social differences as to the role of government. The United States at this point is not quite ready to make a political judgment that it knows what it wants and where it wants to go with that type of measure. That's the basic difference, I think.

Mr. Barabba: It's a lot easier for a country with a population the size of California to get something going than it is to try to bring in all the cultural and subcultural differences that exist within a country the size of the United States. Also, the amount of change that's taken place within the United States, over any period of time, causes you to come up with different programs. Dr. Jones has shown that our economic growth is the size of most countries. We have to have a continually changing kind of program. That's one major reason why it's very difficult to think about it in a more precise set of terms.

Mr. Levine: If you look at our political and social development and go back only a short time, you'll find that there wasn't a lot of Government program intervention in the public area. Go back to the 1930's, and there was very little governmental activity. Even in the 1940's you'd only had a little bit, and it was more in the area of economic activity.

Then you come to the 60's, where you have the vast programs and focusing of attention in this country on poverty, discrimination, and the social measures to improve people's perception of the way they live. This called for a very different evaluation. It wasn't just the same laissez-faire attitude

The view towards people has changed drastically. It's no longer that people are on the public dole; rather, it's an attempt to assist them to be useful, worthwhile, and participating members of the society. In this sense we have lagged in our development because we're a young country in terms of our history. That's the reason that you see many more concerns in terms of social services among the European nations. Its a temporal thing more than anything else.

Student: I can agree with that. I grew up in poverty but unfortunately I didn't know it until I was 20 years old.

SUMMARY OF CONTENTS OF FIVE SOCIAL INDICATOR REPORTS

Country:	United States	Great Britain[1]	France	Sweden	Norway
Title:	Social Indicators	Social Trends	Social Data	Social Development	Social Survey
Author:	Office of Management and Budget	Central Statistical Office	Central Statistical Office	Central Statistical Office	Central Statistical Office
Chapters:	1. Health 2. Public Safety 3. Education 4. Employment 5. Income 6. Housing 7. Leisure and Recreation 8. Population	1. Population 2. Employment 3. Leisure 4. Personal Income and Wealth 5. Personal Expenditure 6. Health and Personal Social Services 7. Education 8. Housing 9. Environment 10. Justice and Law 11. Resources (public expenditures) 12. International	I Active Population 1. Total Population 2. Active Population 3. Employment 4. Working Time and Rhythm 5. Work-related Accidents 6. Labor Conflicts 7. Wages and Cost of Living II Life Styles and Cultural Patterns 8. Household Consumption 9. Household Equipment 10. Vacations 11. Leisure 12. Education 13. Housing 14. Health III Disparities and Equilibriums 15. Social Benefits 16. Distribution and Redistribution of Revenue 17. Private and Semipublic Salary Levels 18. Family Formation and Dissolution 19. Social Mobility 20. Crime	Base Data 1. Population and Family Structure 2. Economic Structure and Development Data on Components 3. Housing 4. Employment 5. Personal and Household Economic Conditions 6. Private Consumption 7. Health 8. Social Welfare 9. Education 10. Crime and Justice 11. Leisure	1. Population 2. Health 3. Education 4. Housing 5. Employment 6. Income and Consumption 7. Social Services 8. Crime 9. Social Participation

[1]The territory covered by Social Trends varies from one table to the next, as is often the case with statistics from the British Isles. In some cases, the data cover only England and Wales, in others, Scotland is added (Great Britain) and in still others, Northern Ireland is added to the foregoing (United Kingdom).

In addition to the 12 chapters listed here, each yearly issue of Social Trends includes a series of essays on topics pertinent to social indicators. The 1973 issue contains the following essays:

Social Commentary
The Elderly
Subjective Social Indicators
Mental Illness and the Psychiatric Services
Cultural Accounting
Road Accidents and Casualties in Great Britain

Mr. Levine: What I'd like to do now is to turn to the role of the Bureau in providing the data that become social indicators. The Bureau's job is to produce the data that people need. It's really a data factory of sorts. I don't think the Bureau's job is considerably different, whether we're talking about social indicators or economic indicators. One way to describe the Bureau is in terms of a story that one of our colleagues, a mathematical statistician, told me many years ago. He told the story of the three umpires. The very young umpire said, "I call them as I see them," and the more mature umpire said, "Well, I call them as they are," and the grizzly veteran said, "They ain't nothing until I call them."

In any case, the story indicates what happens without data—you're flying blind! Until you measure something, you don't know where the devil you are. Probably the classic example of that is a program with which I've been associated a long time, namely, the Current Population Survey. This is the survey that develops the employment and unemployment statistics. It really got its impetus back in the late 1930's. This was the time, as some of you may recall, when we had something which we didn't euphemistically call a "rolling readjustment" or a "mini recession." Rather, we had a depression. On the one hand you had the National Association of Manufacturers saying that there were 3 million unemployed and the AFL-CIO that there were 13 million unemployed. The estimates ranged from one extreme to the other. Finally a survey method called "sampling" was developed. By chance, it reached a point where it could be used, and we began to obtain a constant repetitive measure of unemployment. Since that time, we've been producing measures of unemployment on a monthly basis. Today you not only have a snapshot at a given point in time, but you have a series or a trend, and this enables you to see whether you're going up, down, or sideways.

What does the Bureau do in the "social" area? The place to start is our Government's single largest effort, the decennial census of population and housing.

I don't know if any of you have ever heard it referred to as the largest peacetime mobilization effort. I don't think most of us realize how extensive it is.

For example, in an incredibly short time span of 6 months, we put together and trained a field staff of approximately 185,000 part-time people for the 1970 Census of Population and Housing. It was a very large group, and they were spread over the entire Nation, including the territories and possessions. We opened and operated 400 offices, we printed and mailed some 70 million questionnaires, or more, to 70 million households, just before Census Day, April 1, 1970. By December of 1970, we were able to provide the basic population data to the President in order to meet the constitutional requirement for the apportionment of our Congress. It's really rather amazing it could be done in such a short time. Ultimately, we produced some 2,000 reports and 200,000 pages of information, not to mention tapes, microfiche, and microfilm, and we did it at a cost of around $1.00 a person, or somewhere around $220 million for 1970.

Student: Would you explain what a microfiche is?

Mr. Levine: That's a type of microform. Instead of being a reel of tape like microfilm, it's a square piece of sheet microfilm which is like a 3- by 5-inch card on which you can put a tremendous amount of data. It's a way to store an immense amount of data in a very small amount of space and, instead of having to roll a reel of tape through a reader, you can just pick out the indexed microfiche you want, put it in the reader, and save yourself the time of having to deal with a vast quantity of film or turn pages in a publication.

Let me tell you a little bit about how we took the census. In 1970 we used three forms. The first was a short form which basically asked for a limited number of population and housing characteristics—that is, a list of people in the household and the age, sex, marital status, and race of each person, and a little information about housing, and that was about it. Then we had two longer forms, which, in addition to collecting the limited population data, also obtained considerably more detail from a 20-percent sample of the population. The form to be filled out for each household was assigned on a statistically random basis. We used approximately three-fifths of the households in the country. In advance of the census we developed what we call an address register. We went out and bought commercial mailing lists which gave us addresses in the larger metropolitan areas and some adjacent counties, and then several times before the census we had the Post Office take the address list that we purchased and check it. In fact, they made believe that they were going to go ahead and distribute mail to every one of the households in those areas of the United States for which we gave them address cards. They gave us back a list of the addresses for which we had not provided them an address card, so that we could add the missed addresses to our files. Then we prepared questionnaire mailing pieces for every one of the households, which the Post Office "cased" and later delivered. Each time they gave us any new addresses that they might have missed before, for example, any new addresses which had been opened up, new construction, what have you, since the first time they cased the list. In some areas we went out prior to the census and had our interviewers list addresses where we didn't have a commercial address list and then went through the mail procedure. Respondents were asked to complete the questionnaires and mail them back.

For the remainder of the country the Post Office delivered an unaddressed short questionnaire to every household. Then we had interviewers go around and knock on doors, list the households directly, collect the short forms and interview people as necessary. In addition the enumerator completed a long form for those households designated for the sample. We did this primarily in rural areas where it's very, very difficult to get mailing addresses, particularly where you're dealing with RFD boxes, Post Office boxes, and houses which may or may not have addresses where the only identification is a general description such as, "Down that road, third house on the right with the blue roof." Even so, when you come back 2 weeks later it doesn't have a blue roof anymore!

Student: What was the proportion of the form sent out as to size?

Mr. Levine: Throughout the United States, 80 percent of the population received a short form and 20 percent of the population a long form. That was in order to provide considerably more detail through the use of sampling techniques and thus limit the burden to the population as a whole.

We find that there are a number of bases for deciding how you put questions on the census. If we used every question that people have suggested on the decennial census, every member of the population would be sitting around his household for about 2 hours answering a wide variety of questions and at the same time he would be on the telephone calling his Congressman to

complain bitterly about the invasion of his privacy, and using "expletives deleted" to tell him what he thought about the Census Bureau! Therefore our key criteria are cost, time, and need.

In many cases, the reason a 100-percent count is conducted is that the Constitution mandates it; you must count every person in the population in order to apportion the Congress. To determine certain types of characteristics, however, you don't need to interview every person. Sampling theory is well advanced, notwithstanding the fact that there still are skeptics. Used and controlled properly, sampling can provide data for various geographic levels that serve the needs of policymakers.

The major decision as to the extent of a survey, aside from the fact that you must count everybody for apportionment, is mainly one of determining the level of accuracy required by the uses of the data products. If you need geographic detail down to the block level, you're going to have to ask everybody the same question. If you need detail only for the city of Los Angeles you don't have to ask the full population, you can ask a sample. We try to determine, as best we can, the uses to which the data are going to be put. The needs consequently determine the type of geography and ultimately the required sample size. For example, in order to meet some of the specified requirements, we had certain questions on both the 15-percent and 5-percent census questionnaires so that we could combine them and, in effect, come out with a 20-percent sample. The point I have already made is that if you put every question on the questionnaire, ignoring the possible reaction of the population, the cost would go up prohibitively because the more data you collect the more you have to process, and processing costs are inordinately high.

If you take a category such as occupation, which is a description by an individual of what he does, you have to have a clerical staff which reads every one of those entries and converts them into a numerical equivalent in order to get it into the computer and tabulate it. If you extend that occupation question to the entire population the cost will go up by a function of ten or twenty and you'll have real chaos. Thus, a major problem is trying to decide whether a question should go on the 5-percent, the 15-percent, or on both questionnaires, or whether it has to be asked of the whole population. What we've tried to do is minimize the 100-percent items asked of everybody to decrease the burden on the population, and yet maximize the amount of data we collect by geographic detail for use in policy planning.

Student: Are they proportioned on a random basis?

Mr. Levine: Yes, straight across the board. For example, out of 100 addresses, 15 received the 15-percent questionnaire, 5 got the 5-percent and 80 percent received the "short" form. In addition certain questions appeared on both the 5- and 15-percent forms, so in effect, one in five of the population provided answers to these selected questions.

Student: So you don't know the names of the people who are going to get the questionnaires?

Mr. Levine: We don't know the names of anyone to whom we're distributing questionnaires. We deliver the forms to an address, for example, to 801 Kearney Avenue, Apt. 204, Los Angeles.

Student: Do you pretest your questionnaire before you actually put it in the field?

Mr. Levine: Rather extensively. Prior to 1960, we had not used the mail-out/mail-back approach. In 1960, we went to a modified technique. In some cases, the interviewer who visited the household to complete the short form left a long questionnaire to be mailed in. Since we had decided to use a "mail-out/mail-back" in 1970, we spent quite a bit of time and effort during the 1960's testing the mail techniques because they were brand new. We asked whether we could develop an address register and what kind of mail response rate we might get.

The shift to the use of a mail approach also reflected the fact that we found it difficult to recruit the large numbers of temporary staff required for the task. Also, the social disorientation that took place during the 1960's caused us a great deal of concern so we decided to explore the use of the mails. We assumed, and our testing proved us right, that we would get a very high response rate in a larger part of the country. This meant that we didn't need as large an amount of resources, in terms of followup capability, in those areas. We received over 95 percent back in the upper income population areas, while in other areas where we had expected difficulty we received a much lower response by mail. Then we were able to use fewer interviewers than expected by focusing our resources on those areas where we knew or anticipated we would have difficulties. We ran at least 10 pretests, culminating in 3 rather large dress rehearsals. A pretest is where we go out and experiment in a test setting, where we apply our concepts or techniques to a limited part of the population. A full-dress rehearsal is where we simulate exactly what we are going to do in the census. We did a full-dress rehearsal census in Dane County, Wisc.; Trenton, N.J.; and Chesterfield and Sumter Counties, S.C. These were the bases on which over the decade we developed the techniques. Our overall response rate in 1970 was about 87 percent for the mail approach, but, as I say, it varied considerably; from a rate of 40 to 50 percent in some areas to virtually 100 percent in others.

We plan in the decade of the 1970's to work towards improving and expanding the mail technique. In 1980, we hope to enumerate some 90 percent of the Nation by the mail approach.

Student: How do you handle the language diversity in this country?

Mr. Levine: According to our critics, poorly. Language diversity is one of the major problems that we deal with in a census. We can handle it much more simply in a survey, as I'll indicate later. The way we dealt with it in 1970 was not the way we hope to deal with it in 1980 and certainly not the way we dealt with it in 1960.

The first point, of course, is that in hiring 185,000 interviewers and setting up 400 offices, we try to select people who are indigenous to the area in which they're going to work. If we're going to be distributing questionnaires in an area containing Spanish-speaking population, or an area which is Puerto Rican, where they may speak a different type of Spanish than they do in Los Angeles, we try to find people who are interested in working for us who are indigenous to the area and thus are likely to have the language skills required. Second, we make the population aware of the decennial census through a public relations program. As part of the extensive publicity program we provide addresses and telephone numbers of Census assistance centers to be used if anyone has any problems in filling out the questionnaire.

Further, and this is of extreme importance since there is a

misunderstanding of how we took the 1970 census, we didn't just take what we got back by mail and say, "Thank you very much, the mail returns represent the population of the United States." I'm afraid that isn't what we or Congress would consider a good basis for apportioning that body. Instead, if the questionnaire was not returned, whether because of language difficulties or any other reason, we followed up either by telephone or by sending an interviewer to the household to collect the information, if at all possible, by direct interview. In those cases where the interviewer found that there was a language problem which he or she couldn't handle directly, she went back and got someone who was capable of handling the situation. I would hasten to add that in many households where there is a potential language problem, there are some family members who are generally able to converse in English. It's the older population in particular that has difficulty with language. In many such households, we generally find a younger family member who is able to speak English and can translate from Spanish or Portuguese or Chinese into English. Finally, where we recognized a specific need we hired people with the language skills. In San Francisco, for example, we had a number of interviewers who spoke Chinese or Japanese. Although we did not have a Chinese language questionnaire in 1970, we did provide instruction forms in those languages. In our planning for the 1980 census, we are exploring the possibilities of providing the questionnaires in languages other than English.

We've touched on some of the difficulties faced in the 1970 census, namely, the problems of language and attempting to lessen the respondent reporting burden. Prior to the 1970 census there was a fairly extensive campaign by certain groups objecting to the invasion of individual privacy. These groups wanted to know why we asked the individual's name and income, and they objected to many of our questions in general.

There were some last minute changes made on the 1970 questionnaire, resulting from two features. One is that there are rapid changes in the world itself and particularly so in the late 1960's. The problems in Watts, Harlem, and Washington, D.C., caught us quite by surprise and we wondered what impact they would have on our ability to take the census. Since it takes a good 6 or 7 years to develop a census, it's difficult if not impossible, to anticipate all of the potential problems. In fact, we're already working full steam on the 1980 census and will begin testing this coming year.

The second problem was the passage of civil rights legislation and equal rights amendments, which caused many parts of the society to become more aware of the needs and the importance of census data and their particular concerns as to their own self image.

We, for example, had really never developed an adequate program to measure the participation of the Spanish-origin population in the life of the United States. We provided selective measures, such as Spanish language, citizenship, place of birth, and surname, but we didn't have a uniform measure such as Spanish origin. Reflecting the demands for such information, in May 1969, very late in the census planning, we added a question on Spanish origin in the 1970 questionnaire. This forms the basis for much of the information which we now have on the Spanish-origin population.

Another unanticipated problem was that of geography, which isn't to say that we hadn't been concerned about geography. Obviously, when we said how many people were living in Los Angeles we wanted that count to be as accurate as possible. The attention focused on geography post-1970 is simply far and away much more extreme and intense than in the past. This new concern appears to have surfaced for several reasons.

As we went to the mail technique we had to generate an entirely new system of putting geographic identification on the 1970 census. We developed something called address coding guides where we tried to create lists of streets and address ranges which fell within geographic boundaries. This involved a lot of participation on the local community side and there were real problems because it was the first attempt. I think many people in both the community and the Bureau underestimated the difficulty and complexity of really knowing where the boundary lines were. It turned out that, in some cases, the city planners themselves weren't quite sure where the markers were. The marker was somewhere out in Farmer Jones' field, but you couldn't find it. Prior to this there really hadn't been much social legislation tied to economic or geographic boundaries, so there hadn't been much concern. Suddenly, States and local communities were faced with the concerns of "one man, one vote." When you started dealing with "one man, one vote," people became very concerned as to whether they had the right count of population, not only within Los Angeles, but within election district 36 versus district 42, in the city's south side versus the north side. We found that we had made such errors in geography.

If "one man, one vote" wasn't enough of a problem, Congress passed the State and Local Fiscal Assistance Act of 1972, otherwise known as general revenue sharing, and suddenly every head became an amount of money and we started getting letters by the thousands telling us, for example, that we'd counted the population of a place as 187 when it should have been 212. A major problem we face in 1980 is ensuring that we solve our geographic problems so that we can minimize, if not eliminate, this source of error.

The legislation has helped us to some extent since mayors, local officials, and community activists are aware of the importance of population, they're also aware of geographic boundaries. Each State has established an office which is responsible for maintaining up-to-date records of the current, official boundaries of each general purpose government within the State. Every annexation and every incorporation has to be reported to that particular source. We feel that this development will be of great assistance and make it possible for us to do a much better job in 1980.

Student: That's within this State?

Mr. Levine: That's within each State. That function is required of the State under the administrative regulations developed in connection with this legislation.

Student: Is there any special reason why you have to have the name of the individuals to whom you send the questionnaires? Don't you think you'd get a more honest reply and you wouldn't have this problem with confidentiality if individual names weren't involved?

Mr.Levine: From my point of view the answer is both yes and no. The first question is why do we need the names. It's very simple to look at single family houses in the suburbs and know that if we mail a questionnaire to 801 Kearney Avenue and don't get the form back, we can locate 801 Kearney Avenue, knock on the door and get that questionnaire. However, when you go into the

central city or some of the older areas of a city, there are large houses which have been converted into boarding houses, apartment houses, or rooming houses—what we call disorganized housing units. Inside, we find lots of doors without any identification, and we don't know whether they're A, B, C, D, 1, 2, 3, 4, and what they were yesterday may not be what they are today. So, without names, we're in trouble!

Let's assume that I send out 10 questionnaires and I get 4 back. We have to send an interviewer out to get the remaining six, and that interviewer will not have the faintest idea which four I got back and which six she has to find. Suppose she goes in there and doesn't find 10 addresses, or 10 doors, but, instead 12. Then there really is a problem.

Remember, I also said that we use three forms in the census. We use two scientifically selected sample forms. If the delivery of these forms is mixed up and is not as specified, we may have a biased sample. For example, if the mailman were to have sample forms for apartments 1 and 16 and leaves them in error with apartments 1 and 2, the sample would no longer be controlled. It could be a biased sample. The conclusions that a policy planner drew from that sample's data would be suspect, yet no one would know it. One of the major reasons we need names is to ensure we've counted every unit, in every structure, in every place in the country, and collected the appropriate form for the correct household.

Secondly, when we get a questionnaire back in the mail, it may have missing information. This may result from a poor questionnaire design, language problems, or other considerations. An interviewer has to call back and clarify the error, inconsistency or omission, and it's very difficult to refer to someone in a household without knowing to whom you're referring. Therefore, we find the name is a very useful item which allows us to say, "Mrs. Jones, this is the Bureau of the Census calling. Your husband, Mr. Jones, in filling out his information, or your son, Timothy, in filling out his information, did not answer in a way that we can understand."

Third, the Census Bureau conducts what we call an age search activity. Age search is an operation which provides people, who do not have proof of birth, with legally accepted identification which enables them to get passports, veteran's pensions, Social Security, disability insurance, survivors's benefits, or simply to show (a) that they exist, (b) that they are who they say they are, and (c) that they indeed have the relationship to an individual that they say they do. If a person writes to the Census Bureau and says that she lived at 801 Kearney Avenue at the time of the 1970 census and is applying for Social Security under her husband's benefits, the Census Bureau will, for that person alone, not for anybody else, look up the material for 801 Kearney. We'll see if she's listed there, and certify to the Social Security Administration that on April 1, 1970, she was living at 801 Kearney and was, indeed, the wife of Mr. Thomas Jones.

The name, incidentally, is never used in any of the processing activities beyond the collection process. Once we take the questionnaire and put it into a mechanical form for processing, the name is never attached to the coded data. We store the names, for Age Search purposes, at Pittsburg, Kans., but in the millions of computer data tape reels at the Bureau, there isn't a single name. We use a serial number type of relationship to insure confidentiality and because we're simply not interested in names except as I have described.

Let me go one step further and talk about another reason we do use names. It's not the most important and, perhaps, if the issue really came down to where we couldn't do the census another way except to give up names, we might have to. My reference here is to post-censal studies that we're often called upon to conduct.

Let me give you two examples that illustrate the importance of having names. The National Science Foundation is very interested in knowing what's happening with regard to the supply and training of engineers and scientists in the United States. This happens to be an area of great concern. To develop a new roster of scientists and engineers would require an inordinate cost because they're a rare phenomenon in the population as a whole. You could get lists of the members of professional societies, but not all scientists and engineers belong. Not all people who are working as engineers were trained as engineers so you can't always go back to university lists.

When we are faced with such a problem, we search through our tapes, select those people who's occupations fit the requirements, look up their names, and mail them questionnaires. In this case, you're not just mailing to an address. You're mailing to Dr. Jones who is an aeronautical engineer or Mr. Henry Smith who is a physicist.

Back in the mid-1960's we were asked to participate in an international health survey. There was a concern among the people at the National Institutes of Health that there might possibly be a considerable difference between native born Americans, in terms of the incidence of heart disease and cancer, and some immigrant groups.

What we did was to take two groups. Norwegians have a relatively high incidence of cancer. We went through the 1960 census files and identified people born in Norway and subsequently interviewed them; without the names we'd never have found them.

We also took a group of people who had migrated here from the United Kingdom. The British have a relatively high incidence of coronary disease. We also interviewed this group to find out their health status, their types of health problems, and whether they had any siblings living in the United Kingdom or Norway. We arranged with the Norwegian and United Kingdom groups participating in the study to interview these siblings. We also interviewed a sample of the indigenous population in Norway, the United Kingdom and the United States and tried to compare the health morbidity situation. It was an excellent study that provided a great deal of data to the heart and cancer people. Yet without names you couldn't conduct these types of studies. Whether that's a cost benefit to collecting names is something which society must decide.

Let me make a point. Notwithstanding the fact that the census is mandatory by law and we have the legal right to prosecute someone, we still rely on the voluntary cooperation of the population because we have no way of knowing we've missed somebody if they aren't listed on a questionnaire. If someone returns a questionnaire from household "A" and tells us there are three people, we can't know if there actually were four. The point I was trying to make is the fact that from the vast bulk of the population, well over 95 percent, we receive excellent cooperation. There is no complaint about putting the name down.

Student: You were talking about most people's voluntary compliance. What about where the person doesn't want to answer, to put his name on a form, although he fills out the form completely and just omits his name? Do you go after somebody like that?

Mr. Levine: No. I would say that we wouldn't bother anybody if the form were filled out completely. But the great majority of people do put their names down. Only a very small proportion don't. People who don't want to cooperate just don't return the form.

Legally, the Census Bureau has the right to say, you must fill out everything on the form. As a rule, however, we don't bother the ordinary citizen if most of the form is complete. We may try to get the information by calling back, although we wouldn't call back solely to obtain a name. Now, if the address weren't clear, the interviewer might have to take all of the questionnaires for that particular place along when he or she went back. In other words, if we take the questionnaires along, we can avoid bothering people who have already filled out the forms.

Student: You have stated that only a few people appear to be really concerned about putting their names on census forms. How does the right of privacy and feelings about privacy here in the United States compare with feelings in some other countries? Do you have more of a problem than other countries, or less, and are the attitudes related to people's feelings about the government?

Mr. Levine: I think it varies widely. For example, let's take the Scandinavian countries, and the study I referred to a moment ago. As you would expect, most of the Norwegians in our sample came to the United States many years ago, and were well up in their sixties by the time we attempted to contact and interview them. The Norwegian-dwelling siblings were people who were also well up in their years, and, in many cases, surprisingly, they had not been in contact with the American siblings for a long time. Now, most of the Scandinavian countries maintain what are called population registers. It's a very different philosophy than what we have in the United States. Each jurisdiction has a list which includes every person and when he was born, and every time one moves they know exactly where. You can see the concept of privacy there is quite different in terms of having names and addresses available. Even so, they do have problems with privacy in terms of what data are made available from a census and administrative records. But the population registers are open. Anybody can use them.

In the United Kingdom they have an electoral register, representing every person in the country over 18 years of age, which is made up before each election, checked each year, and published. In Canada they prepare an electoral register before each election and, again, these are published rosters of everybody of voting age. In the United States the reaction would be quite different if we were to publish lists of where everyone lived. So you have different views of privacy and confidentiality.

The United Kingdom does not collect income information in their censuses, since it is a tremendously controversial item. They did a small sample survey on income and they had hundreds of complaints.

In some countries, on census day no one's allowed on the street. It's not a legal holiday, you just have to stay in your home until you're counted.

Student: Do you have any way of knowing from the census information who are illegal aliens?

Mr. Levine: No, there's no way.

Student: Do you allow for that?

Mr. Levine: The census covers everybody in the United States on April 1, 1970. The census contains a question on place of birth and citizenship, but that doesn't tell you whether the respondents are illegal aliens or not, as there are a lot of visitors in the United States who are counted in the census.

The question of illegal aliens presents another type of problem. If illegal aliens don't want to be counted we don't know how to count them. There's an argument in the Bureau as to whether we do, in fact, get them in the population count. Some people say illegal aliens would never report themselves; other people say that when you go to a household containing only illegal aliens, and somebody answers the door, it's very difficult not to get the count of people there. They may tell you they were born in the USA, but they're illegal aliens and you never know it. You have two possibilities. One is that you get them but you don't know they're illegal, or if they're living in a household where there are six people, you may only have five reported. That's the other problem. There's no way we know of counting illegal aliens.

Student: Where does the Bureau of Immigration get their estimate?

Mr. Levine: They get it the same place that I suggested that the CIO, the NAM and other people get their estimates. There are a lot of estimates around. The Bureau of the Census said that there were 10 million people of Spanish origin. Spanish-origin leaders tell us there are 12 or 13 million. We ask them where they get their number and they say, "We know there are 13 million so, therefore, you undercounted by 30 percent." And we respond that we counted 10 million, and how do they know there are 13 million? They just know.

One of the things we do know is that we will never obtain perfection in a census. I don't care if we made everybody stay at home or anything else you wanted. That's the other point I wanted to make about privacy and confidentiality. We're a country that has certain traditions. There's a limit to how far one can go in coercing the population, and we don't want to coerce the population. We go out and try to suggest to people that there are valid reasons for participating in this activity. There are social benefits to be derived from being counted, from having accurate statistics developed.

It's hard, and we're struggling with it, but from various techniques we've developed we are aware that we undercount the population. The Bureau estimated in 1972 that we undercounted the population in 1970 by 2.5 percent or approximately 5.3 million people. Now, 2.5 percent is something that sounds great if you accept the view that we should stop looking at the hole and instead look at the doughnut, where we got 97.5 percent of the population. That's great! We can break our arms patting ourselves on the back, but our critics don't allow us that luxury because there's revenue sharing, and social programs which go to minority groups. The hard fact remains that our analysis, though it is an estimate, suggests that we missed about 1.9 percent of the white population and about 7.7 percent of the black population. We want to do a better job in 1980 and a better job in 1990 and even better in the year 2000. But, I'm sincere when I say I don't think we'll reach perfection.

At the other extreme, we may reach the point where we overcount the population and this is a major concern, as well. It's almost as bad as undercounting. If people become very much aware of the fact that revenue sharing is apportioned to some

extent on population, there could be a tendency for an organized campaign to develop in certain communities, to add an extra child to the questionnaire. If we get a questionnaire back and it has two children on it instead of one, or three children instead of two, there's no way that we're going to be able to tell you that it's wrong, except through an ex post facto analysis which will say that it looks strange, but for once we have apparently overcounted a specific age-sex-race group.

We're currently spending an inordinate amount of time trying to develop the techniques we will use in 1980 to minimize the possibility of missing population. Actually, we began this development in 1970. I think we recognized there were areas of the country, like inner cities where we were going to have problems and therefore we put much greater resources in those places in the way of interviewing staff and offices. We had a larger public relations campaign directed toward these areas. We had a community services staff which talked to community leaders to explain what the census was about, in order to get their support, and to get those leaders to go on the radio stations, mount the pulpits, and what have you, to explain the importance of being counted in the census.

We plan to extend that tremendously in 1980. We plan to deal with all levels of community leaders and their representatives much earlier in the decade of the 1970's. We have already started discussions with Spanish and black groups in order to try to explain why the census is important to them, what we can do for them, and, hopefully, to have them tell us the problems they perceive in our credibility. We want to discover how we should reach their population groups, what's wrong with the questionnaire, what types of data they want and, in turn, how they can use the data, when we will produce it, and how we will produce it.

I've been asked a question as to whether the current Administration, or any Administration, has an impact on what we do at the Census Bureau. I would say, unequivocally, that the methodology is a function of the technicians deciding what's best and demonstrating to policymakers that such and such is the technique to use and this is the way it will go. There's no question about the fact that Congress plays a very important role in this. Every one of the agencies in Washington has to report to Congress, through an oversight committee that looks at it from its operational standpoint and in terms of double jeopardy through the budget process.

Theoretically, we could come up with a technique that showed the best way to do the census was to make everybody stay at home, but I'm sure that would be a political decision. The Congress would probably replace the technicians who advocate such a course. Or we could decide that the census should cost, in order to do the job right, $800 million and Congress might take a jaundiced look and judge whether the social benefit of an $800 million expenditure outweighed the economic problem that such an expenditure would pose.

Congress is more concerned with privacy, confidentiality, and the individual reporting burden, than it is with the actual questionnaire content.

Mr. Barabba: One has to keep in mind that there is an extensive and time-consuming process involved in developing the forms and materials for 1980. When the technical staff is ready to submit the materials for congressional review, the Congress is faced with reviewing, in a very short period of time, a volume of evidence developed by a systematic and professional approach to what's needed. Since the census is such a general statistical instrument, the other Federal agencies who use it also make input to our questions. If it is decided to change or modify an item, ideally, we would want to have the concurrence of those other agencies. It's not impossible; a question can be changed or modified as then Commerce Secretary Stans did with our question on "sharing showers,"—not a political decision, but a reaction to and a recognition of the sensitivity relative to the need.

Mr. Levine: The content of the census is not developed in a vacuum. As I indicated, we talk all over the country with community leaders, policymakers, mayors, and planning commissions. In addition, we invite all the Federal agencies to comment, in order to determine their needs for data. Federal agencies are, after all, a reflection of their own Secretaries, and the Secretaries are political. Late in 1967, President Johnson's Cabinet reviewed the plans for the 1970 census, and there were very serious questions raised by the Secretaries of Labor and HEW, because they felt that the programs of the Administration required data which would not be collected in the 1970 census. I think that's a valid question to raise. I don't call that a political decision. But I think you're right, it does reflect the political philosophy or the social philosophy of an administration. They were particularly concerned about poverty at that point and they didn't feel there were enough questions on the census relating to the causes of poverty.

As a result of the White House's concerns, we went forward with a supplemental request to Congress for some $10 million to conduct post-censal surveys, called the Census Employment Surveys, which were carried out in the ghetto areas of 51 cities throughout the United States. We chose 60 areas in 51 cities and conducted detailed surveys of the reasons that people weren't looking for work, the reasons that they were working less than full time, and asked questions about all of the factors which were felt to be germane to the problem of why the economy wasn't supporting these people adequately. That type of activity certainly reflects the social needs of the moment.

What I've handed out is the 1970 census questionnaire. (See appendix.) These questions can be grouped into about five components. You begin with the basic demographic items, followed by migration, ethnicity, social and economic aspects. As I said, this is a somewhat arbitrary grouping.

The demographic questions include age and sex, and you can see those right inside the front cover. For migration we included State or country of birth, place of residence 5 years ago, and year moved into present house.

Under ethnicity we have color or race, Spanish origin or descent, country of birth, country of birth of parents, citizenship, mother tongue, and year of immigration.

Social questions are those relating to family or household relationship, marital status, years of marriage, number of children, years of school completed, school or college enrollment, vocational training, veteran status, and disability.

For the economic side, we collected information on employment status, hours worked last week, weeks worked last year, the last year in which somebody worked, occupation, industry, class of work or activity 5 years ago, income last year, place of work, and means of transportation to work.

Student: What is the marital status of a common law relationship?

Mr. Levine: It depends upon how it is reported. If reported as

"never married," then it is "never married," because we have no way of checking, as the designation is up to the individual. Again, the Census Bureau would like to get the most accurate data it possibly can. On the other hand, the Census Bureau is not "1984."

We rely on the individual and that's one of the reasons we went to the mail technique. We no longer have, in the vast majority of cases, the interaction of an interviewer and the respondent. We felt that when an interviewer knocked on a door there might be some intimidation. Having someone standing there, residents might not want to admit they are in a common law marriage, that a child is illegitimate and they are not married. Also, having an interviewer there implies communication and you might misunderstand the question asked or you might be offended by the intonation in the voice. Mail allows you, within the privacy of your own home, to answer any way you want to.

We indicate that we want the most accurate information but if you don't consider yourself in a common law marriage, and the key word is "marriage," and you put down single, then our statistics will include you as "single." You and your "roommate" wind up as two single individuals living in one household. We suspect that people of different sex living together in the decades prior to 1970 were reluctant to report themselves as "not married," that they were less concerned in 1970, and may be even less concerned in 1980. We had a much larger number report in 1970 than in 1960, that they were unmarried partners of different sexes. In 1980, we think that more people will be willing, because of the increased social acceptability of this living arrangement, to report themselves as co-partners.

Student: How do you handle head of household if both of them are working?

Mr. Levine: Working is not the determinant of "head of household."

Student: Can you have two heads of household?

Mr. Levine: No, at the present time, you only can have one. In a general sense, our concepts reflect the social acceptance of certain types of arrangements. Up to 1970, the "head" was nominally the married male member of the family. We are grappling with the problem of what we're going to do in 1980. We really don't care who's the head. What we really need to determine family relationship is to learn every member of that household's relationship to the same individual, so we can put them all together.

We have done studies of what they call kinship and it gets very difficult in trying to decide, socially or through social theory, who is the head of a household. Is it money? It's not necessarily the main earner in the household. It could be a household which, because of its social orientation, lists the senior member as the head. It can be the wife; it can be any member. Incidentally, again, it's a very small proportion of the population that has raised this question, but it's one we're concerned about nevertheless.

Student: Is it really necessary to designate someone as head?

Mr. Levine: Yes and no. What is necessary is to designate some "key" member of the household so, as I have stated, we can obtain family and household relationships by determining how each person is tied to the key individual. We don't, at this point, feel we can just say, "put anybody down on that first line." For example, suppose someone enters a child 15 years of age, on the first line. The consistency of the relationship item across families, particularly when examined by characteristics such as income or occupation, would be most suspect, if not totally useless.

Student: You certainly have to be very careful about this semantically.

Mr. Levine: Semantics is a real problem. As you look at this questionnaire you can see that it is positive. When you take this and put it in an envelope and include a return envelope, you have a problem in how large you can make it and how much instruction material you can put on it. We've enclosed an instruction sheet but we're not sure that's the best way. Now we're talking about the problem of what we do in 1980 about Spanish language.

We really have some very serious problems: we have to get a device which will mechanically enable us to handle a paper size which the Post Office will accept, which will go into not only the slot in the mail box but also go into the apartment houses' little boxes, without being crushed so badly that the creases in the paper become marks when we read it through our film optical sensing device.

Student: What stage of preparation is the Bureau in for the 1980 census? How far along are you with testing and developing the questionnaire?

Mr. Levine: Let me make a key point. Remember, we said that one of the main uses of statistics, whether social or economic, is in trend analysis, and you're pretty well locked into an awful lot of this subject matter. We must, by fiat, count every person in the population. We have to get their age, race, sex, marital status. We want to know their incomes and their work experiences because these are key factors. We want to know fertility. So there's really very little flexibility. What we see, going towards 1980, is probably an expansion of post-censal surveys to attempt to focus in on key subtopics rather than expanding the questionnaire to the point where everybody in the population has to sit down for an hour and a half.

Secondly, many of the investigations that you want to make are considerably more complex in terms of their organization and questioning and require a highly skilled interviewing staff. You can only do that if you have a much smaller interviewing staff and use sampling, where you can really devote more of your resources to the quality control and the control of response error, the latter being a key factor.

Mr. Barabba: Why don't you talk a minute or two of Bureau conversations about questions related to housing, and the trade-off between having the same questions over time and a better measure of housing quality, which may require more or different questions.

Mr. Levine: You'll note that the 1970 forms contained a series of housing questions. In recent years, serious questions have been raised concerning the adequacy of housing in the Nation and every administration has tried to address this issue since the early

1930's. One of the major problems we have is establishing a viable definition of "good, quality housing," or just "quality of housing."

As I said, we want trend analysis, but we don't want trend analysis of measures which are no longer applicable or meaningful. As the population changes, for example, from agriculture (which was a major factor of the population 50 years ago) to an industrial society which requires many different questions, we have to recognize at some point in time that it is necessary to break continuity, develop new measures, improve concepts, and, if necessary, actually break the series completely and start over again.

What we are doing in the housing field is investing a tremendous amount of resources in trying to get agreement on such matters, not only among ourselves but among the agencies most concerned, such as Housing and Urban Development and Social Security. Housing quality is one of the major factors in determining levels of living. What used to be "housing quality" 20 or 30 years ago is no longer applicable, when you look at what now constitutes an adequate support level.

For example, to have suggested that someone on welfare should have had a television set, would have resulted in quite a number of raised eyebrows. Now, television is considered a means of communication and a necessity in many places. Therefore, one may qualify for benefits even though a certain amount of income is going into television or certain other amenities.

In the past we measured housing quality by whether the house was dilapidated or not, whether it had plumbing and electricity. Today, most houses in the United States have electricity. The concern about quality of housing has now shifted to the environment around the household. Is there transportation? Now this becomes a major factor. People can't get to and from work without transportation. What kind of shopping is available? What kind of neighborhood? Is there fear about crime in the neighborhood?

Today, we're looking at measures of quality of housing which extend beyond the four walls within which people live to the environment around where the people live. Do you have a railroad track in front of the house? People never considered that a major problem before. Now some people do. What's the availability of schools? Where are the buses? So we're trying to look at people based on their housing's relation to the environment. This is what we're trying to develop as a measure of housing quality for 1980.

Barabba: Then we run into a problem. Let's say we come up with a new measurement of housing quality and everybody agrees that it's meaningful. We come out in 1980 and we say that 30 percent of the housing in the United States is not adequate. Is that 30 percent an increase or a decrease from 1970? There's no way that we can know because we are measuring it differently. That's where the trade-off is: what is the value of this information? Is it more important to get a new more meaningful measurement than it is to be able to measure a possibly meaningless change?

Mr. Levine: There is the same problem with rent. There are many more supplemental rent programs now than there were 10 or 20 years ago. If we obtain a current measure of rent and compare it with past measures, it may be meaningless, because we now have subsidized rent in many areas. Therefore, you can't always look at rent as a direct measure of quality in housing. In fact, you may find, in some of the more difficult areas of the city, that the rents are higher than they are elsewhere. Then rent becomes a different measure. We have to evaluate our measurements in terms of what I would call reality.

Student: Which still lays open the question about the head of a household in a changing world. At what point does the term become meaningless? For instance, I read recently that there are something like 8 million unmarried female adults now in the United States. Out of that 8 million let's say there are so many million living alone that, perhaps, would check head of household. But what about those who are living with someone, either male or female, in some type of egalitarian arrangement where there are no children?

Mr. Levine: One way to cope with this problem is not to look at a single measure. Let's take the case that you just mentioned of 8 million women living alone. One of the big explosions of the last 10 years has been the growth of the one-person household. We look at size of household, size of family, and at the age of the people who are living alone and find them at both ends of the spectrum which tells us something.

It indicates that a lot more older people now are economically able to maintain their own households than 20 or 30 years ago, before the advent of Social Security.

Secondly, it tells you that the social relationships which existed 20 or 30 years ago of extended families within one household no longer exist. The children don't live with their grandparents, their parents, and all the way down the line. Our society has changed so we look at size of household by age. We look at the younger side and then at marital status and see that a lot more women living alone are divorced. And we find by looking at other measures that divorce is much easier to come by and much more socially acceptable now than it has been. You discover that today kids are economically able to leave their nests much earlier.

The first thing to do is look at the whole spectrum of available data. The social observer takes a look at all of the component pieces. He looks at the income of these women, their work experience, the number of children in the family. It's a composite picture that you get by fitting individual pieces within a social context.

The second thing is to recognize the problem, and experiment during the decade as to how to change the questions that will be asked in 1980.

Barabba: And if we find, as we're conducting these test interviews, a lot of people who say, "I really resent the fact that you have the head of the household question basically designed with the male in mind," then that's something we've got to consider, because if it's prevalent throughout a community it could affect our response rate.

Student: You would be undertaking this not only as regards identifying heads of household but other questions such as income.

Mr. Levine: Sure, we have a lot of serious problems here.

Student: But that's important for economics, for welfare purposes, Social Security purposes, Revenue Sharing.

Mr. Levine: Very, very much so.

Mr. Barabba: So, in a sense, you have to develop a feedback mechanism and that's what these tests are all about.

Student: Out of curiosity, I notice that you list 1860 as the earliest possible year one could have been born. Is there anybody in the United States over 110 years old?

Mr. Levine: We found too many centenarians, I'll tell you that. Because we made an error in the way we set up the question on the form, too many centenarians were reported. Seriously, however, in answer to your question, I just don't know if anybody in the United States is over 110 years old, which shows you how confidential the data are.

Mr. Barabba: For statistical purposes, it really makes no difference whether they're 110 or 120. It's immaterial.

Student: Could you explain how you caught the error on the centenarians?

Mr. Levine: There are a lot of different ways we could have caught it. The most direct would have been to have someone look at the data and say, "My God, we goofed!" But that wasn't the way we caught this one.

There is a technique called demographic analysis, which is really how we measure the undercount in the census. Centenarians are a relatively easy problem. What we can do is take the number of people reported in 1960 who were 90 and over, then age them. We have very good death records by age, so you apply specific age mortality and that gives you a fairly good idea of how many people there should be who are 100 years of age in 1970. The one component you're missing is the migration of the population. It's possible that a lot of people can leave the country and go where they want to. But generally speaking, for that population group 90 and over in 1960, there isn't a lot of migration.

So we took a look at our demographic projection by carrying the nonagenarian count forward, and decided there was something amiss in our number of centenarians. Then we went back and tried to find out why. When we looked at some questionnaires and compared the write-in entry with the marked entries it turned out that there had been some misunderstanding on the part of the population.

Student: Do you do that for all the questions—try to catch mistakes?

Mr. Levine: Basically, yes. We do it in terms of trying to measure the undercount of the population. We do a tremendous amount of work on the questionnaires in terms of trying to see how they deviate from norms that, based on our experience, we would expect them to look like.

For example, if you have a county in Kentucky, like Harlen County, and you get the income distribution and you find out the median income is $26,000, it doesn't take very long to decide that there is a problem because Harlen County is basically a coal mining community and the median income in 1969 was significantly below the norm. We pull the Harlen County questionnaires and may find that somebody spilled a cup of coffee on a half-dozen questionnaires, and coffee will read on this questionnaire as a dot. Or we may find that the interviewer was very poorly trained and made a mistake all the way along the line. We found this to be the case in some of the rural counties where farming is predominant, and we asked for net income and a number of people reported gross income.

We compare our data against independent measures that come from other sources, for example, against estimates of various types of income developed from Social Security. We do birth registration studies for kids under 5 to see whether we've under-reported, overreported, or misreported them. You can do internal analysis. If you see a household where you have a husband 26 and a wife 66 and three kids 10, 8, and 5, we have a feeling that there may be something wrong there and you try to look at it and make some judgments as to what problems we have.

Student: Is this all computerized?

Mr. Levine: Yes. But computerized or not, eventually you get down to the human being who has to look at the data and make a decision whether to change it or leave it alone.

Student: He's referring to tests. Do you have a program that imputes this data?

Mr. Levine: Yes. We have edits; we impute data for people who weren't counted; we have evaluation programs; we have post-evaluation programs. After the census we spend a considerable amount of money going back and doing reinterviews of a sample to get some idea of what may have been wrong in the areas that we measured originally. We ask more intensive types of questions to find out what was wrong with various categories of questions.

Student: In other words, the 1970 census is not finished yet.

Mr. Levine: The 1970 census question is 99-percent finished, the 1 percent is what we're going to do in the way of further evaluation relative to improving the 1980 census. Each census contains within it the seeds of the next; things we've experimented with or that we've learned. We'll go back and retabulate, play around with it, look at the problem areas.

For example, one of the things we found in our demographic analysis was that, after several decades of improved coverage of children under 10, this census seems to indicate increased undercoverage of this group. It's very strange; we didn't understand why. And we've been examining and exploring the "why." You'll note that this questionnaire has eight lines listed for people to report themselves. There's a suspicion that when the household had more than eight people we may have lost them, as the last people listed on most questionnaires are young children. We have a feeling that some of our continuation sheets may have been lost or separated from the original sheet and, thus, may have been made separate households. The age of a household head can't be under 10, so it would have been changed by imputation. So we may have lost children that way.

There are two types of problems that you have in a census. The first one is coverage of the population and the housing units. Did you get to every person? Did you get to every unit? The second question is, having arrived there, what types of content problems did you have? Did they misunderstand? Did they report the age incorrectly, did they misunderstand the race question? You have content questions, identification-type questions. For example, if you use a category such as "Mexican-Americans" and

the population that is Mexican-American does not consider itself as such but would only answer to "Mexicano," you have introduced serious problems into your data. Therefore, we do a content type of analysis and try to learn what we did wrong.

The question that I am asked most often is what do we do the other 9 years? We don't just sit there and put sack cloth and ashes on our heads and hide. We live in a very dynamic society and it's becoming more dynamic and more complex every year. We try to meet the data needs of the population at large, by conducting sample surveys during the decade, on a wide variety of topics. The Census Bureau conducts quite a number of surveys on its own behalf, and those are surveys for which Congress has mandated one way or another that we should receive the funding. In other cases, the Census Bureau acts as a very large statistical resource in which we undertake activities for other Federal agencies that want statistical data compiled. What we try to do is marry these two tasks in order to conduct them as efficiently as possible.

Let me talk a little bit about what we do in between these decennial censuses. As I've indicated, we don't really stop a census anymore. In terms of its publication program we finished the 1970 census in June 1973 and in July 1973 Congress gave us money to start planning the 1980 census. However, let me go back to what I consider the oldest, the most extensive, and probably the most useful sample survey we have. The CPS, as we affectionately call it, otherwise known as the Current Population Survey, is a sample survey that came into being in August 1942. It was developed basically to meet the question that I raised at the beginning of my comments, namely, how many unemployed are there in the United States? Obviously, unemployment was a major question in the 1930's and sampling theory had reached a point where it was feasible to develop a sample survey which would meet three objectives: To produce reliable statistics each month, to produce them quickly and efficiently, and for those statistics to remain durable over time. Durable over time means that as many times as you do it you get measures which are consistent over time, that it doesn't blow up in your face. The survey covers the total civilian noninstitutional population of the United States, which is different from the total resident population and from the total population. It's grown over time from an original sample size of 25,000 households per month throughout the United States, to where each month during the year we now contact and interview some 45,000 households.

The CPS is probably the most accurate and reliable sample in operation anywhere in the world. If you look at the unemployment estimate it produces, it has a 3 percent coefficient of error attached to it. This means that if the unemployment rate is estimated at 5 percent, you have less than a two-tenths of a percent variation. That's its accuracy. It's a very, very comprehensive and extensive sample survey.

Barabba: We were talking with Dr. Wirthlin about that slope of the confidence interval—how little each interview contributes after you get to a certain number. In this case, if we use the CPS as an example, we interview 45,000 people because two-tenths of a percent variation is extremely important.

Mr. Levine: If all you are interested in knowing is how many people use Brand X, you might not want to use—nor need to use—50,000 households. It's an expensive method. As the Director has just said, many surveys for political and commercial purposes deal with samples of 3,000 persons or less. In terms of getting magnitudes of error where they're interested in 5 percentage points on a 50-percent base, they're willing to live with a result which is accurate within a range of 45 to 55 percent. In the CPS case a good deal of money, economic and social policy, and human welfare rest on the data that come out of this survey. That's why we've gone to the trouble of designing a survey which has a high level of precision.

We collect the data every month by way of 1,000 to 1,200 interviewers spread throughout the country. The sample is located in 461 places throughout the United States, including Hawaii and Alaska—we have a sample in each State of the Union. Each month during the week containing the 19th day of the month, the interviewers knock on doors and begin contacting the 45,000 households to ask the questions that you have before you. (See appendix.) The data relate to the week containing the 12th day of the month, so when an interviewer comes on Monday of the week containing the 19th, he or she starts out by saying "Last week what were you doing most of the week—Working, keeping house, going to school, or something else?"

If you turn to the questionnaire and the yellow control card (see appendix), I'll describe how we collect the information. The control card contains a continuing record of the basic classification information which the interviewer obtains at the first visit to the household. We visit each household for 4 consecutive months, drop it out of the sample for 8 months, and then visit it a year later for the same 4 months; thus, a household participates in the Current Population Survey for a total of 8 months spread over a 16-month period.

This type of design has a number of advantages. First, if we had to develop a new sample of 45,000 households each month, the costs would increase appreciably. With this design, we bring in 25 percent of the households a month. Six thousand of those households were last interviewed a year ago, 6,000 are coming in for the first time, so each month some 75 percent of the households are identical to those interviewed the month before and 50 percent of the households are identical from year to year. This approach is a compromise between obtaining the best measure of change by dealing with the same sample and obtaining the best measure of level by dealing with independent samples.

The data collected during the week of the 19th are processed the following week, and 2 weeks from the time that they're collected they're delivered to the Department of Labor which is responsible for publishing these data on the following Friday. So within 2-1/2 weeks from the time we collect them, they're on the street. That's how urgent it is that we distribute these data currently.

If you move over to page 4, column 2 of the CPS (see appendix), you'll see that the second priority is people who did not work last week but had a job or business from which they were absent. Since they do have a job we find out whether they were paid, the reason that they weren't working last week, whether it is a full- or part-time job and their occupation and industry. If you move over to the next column you'll see the variety of information that we collect for the unemployed. What they did to look for work, the number of weeks they were looking for work, when they last worked, whether they're looking for a full- or a part-time job and, finally, their last occupation and industry so that we can classify the unemployed by their skill level.

People answering "no" to those questions across the top (20, 22, and 24) are neither working, absent from a job, nor looking for work. These are the people who are not in the labor

force, and we have characteristics in the extreme right-hand column of the "not-in-the-labor-force" group by age, sex, marital status, veteran status, and educational attainment. Those characteristics apply to those in the labor force, as well. If you look down the 24 series you'll also see that for those who are not in the labor force, or in the so-called labor reserve, information is obtained on when they last worked; if they worked in the last 5 years; their occupation and industry; whether they intend to look for work; and why they don't look for work. We do collect a very large variety of information on characteristics of the entire population at work, looking for work, or not in the labor force.

Student: How are the data collected?

Mr. Levine: We ask the identical questions of every individual in the household 14 years of age and over. It's true we generally get the information from one adult for all members of the household. That's how the data are collected.

The questionnaire you have is the March questionnaire and what that tells you is that when we started this survey, the whole focus was employment and unemployment, and we had a very small questionnaire. It didn't take the planners, analysts, and policymakers very long to figure out that if we were going out and knocking on "n" thousands of doors every month to collect the basic data, it would be very easy to ask another question, another question, and another question. In addition to the basic purpose, which still remains that of providing the labor force data, we now ask supplemental questions virtually every month of the year.

In March we conduct what we call our mini-census. In effect, we get an intercensal measure every March, which is as close as we can get to the April 1 date, of many of the same types of data that we collected in the census. If you look at the righthand pages 5, 7, and 9, you'll notice that in March we collect information on work experience during the past year, migration, family relationship, income, ethnicity, and we have an additional series of questions which obtain the characteristics of the children as well. Through the March supplement we can provide measures, for families and individuals, of ethnicity, household composition, income, educational attainment, a whole host of data.

Let me point out again that we are looking at this measure from a variety of perspectives. One of the things we are looking at, certainly, is the unemployment level. There's no doubt about it. But the level alone is not too meaningful as you heard Mr. Barabba mention this morning. To know that unemployment is 5 percent doesn't necessarily tell you anything, unless you have a base of comparison. If you are conducting this survey, as we are continually, and the movement into unemployment and out of unemployment remains fairly constant, then your measure of change is unaffected.

Really, what policymakers are looking at is not so much the level as the change. When you pick up a headline and read that unemployment is 5.2 percent, remember that isn't the only statistic we produce. We produce monthly a tremendous amount of detail on the labor market activity of the population, which permits you to look beneath the overall number and examine unemployment by marital status and race; how many are teenagers; how many were laid off; how many have been looking for work for short or long periods; what types of occupational backgrounds they've had; which ones are in poverty; which ones are not in poverty; which ones are primary earners in the family; which ones are secondary earners.

What we do is try to refine and hone our concepts and measurement techniques in order to minimize the variation around the extremes. It's like any other measure. I will say that over the years when you look at unemployment, and ex post facto go back and look at turning points in economic activity—when we're in a recession or when we're coming out of one—you'll find that unemployment is a pretty good coincident indicator. It moves very, very rapidly and very extensively.

Most policymakers are not just concerned with the overall total. They look at what's happening to the heads of households, the family composition, what's happening to women generally or teenagers generally. Take the unemployment rate for teenagers, for instance. Whereas the overall unemployment rate is now about 5.2 percent, the teenager unemployment rate is running close to 15 percent. Or, take the black rate which is twice the white rate. These are the ratios to look at.

Mr. Barabba: Let's say that you look at this and somebody wanted to change the unemployment question. How does a person go about changing the questionnaire relative to unemployment?

Mr. Levine: I don't think "a person" could do it. These are concepts which have been developed over long periods of time after extensive research. Some of you may recall that when John Kennedy became President in 1960 we were almost in a recession. The Eisenhower Administration had come out of its term of office with economic activity at a rather low level and unemployment was rising rather rapidly—well over 6 percent. When unemployment starts to rise, you've got a lot of people raising questions about it. **Reader's Digest,** for example, published a number of articles strongly suggesting that unemployment was really a meaningless concept. A new administration is very sensitive to these kinds of changes and President Kennedy appointed an advisory committee to look into the problem.

The Committee to Appraise the Employment and Unemployment Statistics was under the chairmanship of Professor Aaron Gordon of the University of California. The committee examined the concepts and methods used in producing the labor force estimates in great detail and issued its report and recommendations to the President in 1962. Congress provided funding in 1963. Extensive research and field testing was carried out through 1965, before agreement was reached at all levels of government on the changes to be made. Even then, both the old and new concepts were carried out in separate surveys for all of calendar 1966, both to provide a measure of the difference in trend and level and the basis for restructuring retrospectively an historical series by age, sex, marital status, and race. Finally, in January of 1967 we shifted fully to the concepts, methods and techniques that we use today.

Student: Did you find a significant difference between the sample surveys that you were running during those years? I assume that you did because you made a change.

Mr. Levine: There were a number of things that we changed because the Gordon Committee asked us to change them. For example, some of the fairly simple ones were: Prior to 1967 the unemployment rate included everybody 14 years of age and over. The Gordon Committee decided that 14 and 15 year olds, based on the school enrollment rates in the United States, were

inappropriate to include in this economic and social measure of unemployment. They suggested that we collect the data, but that it not be included in the official measure. The first thing was to drop the 14 and 15 year olds from the official measure.

The second thing was that our unemployment questions were not as specific as they are now. The unemployment concept in the past was merely that you had looked for work within the past 30 days but you didn't have to have an activity attached to it nor did you have to be available for work. That immediately cut out a lot of peripheral lookers.

Another thing we did on the employment side was to tighten up some of our hour measures. We also shifted the priorities around somewhat. Prior to the change, persons were classified as looking for work even if they also had a job but had not worked at the job during the survey week. The priorities were changed at the suggestion of the Committee such that first priority is given to those who are working, no matter whether they were looking for work. Those with a job or business, although not working during the survey week, are given second priority; unemployment is the third. So there were some shifts of that sort.

The result of some of these conceptual changes was to alter the seasonal pattern, which is very closely observed. Before the change you would find a big jump in unemployment in certain months because kids who were about to get out of school were looking for summer jobs. When we added the "availability for work" concept, we moved those kids out of the unemployment measure in May, for example, and moved them into the unemployment measure in June. We shifted the temporal relationships over the year because a lot of kids start to look for jobs even though they're not available for work until early June. Actually, we shifted the level in a very, very minor way, but we changed the contexts, the movements within.

The difference between this survey and the census is that the survey utilizes a skilled group of interviewers on whom we spend a tremendous amount of time and effort training them in how to handle relationship problems and general conceptual problems. We can't have this detailed training, where we hire 185,000 interviewers to train and send out in a very short period of time.

We have developed a highly skilled core of interviewers who are very sensitive to the population's nuances. They are not only sensitive to relationships, but race, ethnicity, marital status, everything. We give them a rather intensive initial course of training. We observe them frequently, and provide training every month. We reinterview a sample of their work without their knowledge as to when it's going to take place. We edit their work every month and feed the results back to our Regional Offices to determine whether their quality is acceptable or whether they require additional training. Here we've put our resources into people as well as into questionnaires. In the mail-back census we have to look at ways of bridging the gap left because the interviewer isn't there to help respondents interpret the forms.

Student: I have a question on "other income." I'm rather curious as to why you don't list child support. I would assume that it's shown under regular contributions when a person's not living at home?

Mr. Levine: A moment ago, I mentioned that when we do this survey we hold a group training session. That is, we bring our interviewers together and we devote 8 hours to these concepts. It's the home study, plus the group training, plus the continual training that teaches the interviewer what's included under income. The other point is that you can only get so much on a questionnaire. You can't have 52 items on it. What we have done is try to group different types of income in different categories and regualr contributions do include child support.

Student: Except I think frequently you find that they're very irregular.

Mr. Levine: You'll notice there's an item there for other income, as well. We ask them for any income, for total income. It's a very detailed probe in terms of income.

Student: Is it only every 10 years that you hire this 185,000? How many of that 185,000 are more or less a year-round staff?

Mr. Levine: None. We have an independent field staff, the numbers of which vary depending upon the workload. This survey uses about 1,100. We probably have anywhere up to 1,700 interviewers working with us at any one point in time. And the 185,000 are hired only once every 10 years.

Student: I would assume a goodly portion probably did it 10 years ago and they're going to do it this time.

Mr. Levine: No, it's generally a completely new staff.

Student: Over what period of time are these 185,000 basically employed?

Mr. Levine: This group will probably come on board sometime in March of 1980 and they'll work through, possibly, June of 1980.

Let me mention some of the other types of information we collect in the CPS. For the Labor Department, I've already mentioned the data on annual work experience; we also report multiple jobholdings, whether people are holding more than one job; job mobility, how many different jobs people handle over a year, whether they get premium pay and overtime pay; weekly earnings; labor union membership; pension coverage; college participation. For the Census Bureau itself, we put out reports on migration, income, poverty, ethnicity, child spacing, fertility expectations, education, school enrollment, family and household characteristics, voting habits, housing characteristics, and vacancy statistics. Then for what we call the nonrelatives, the people outside the Labor Department and the Census Bureau, we've used the CPS to collect information on health and disability, food stamp participation, immunization status, television ownership, farm wage workers, use of veterans' benefits, use of programs by widows of veterans, recreation, participation in hunting and fishing activities, to mention only a few.

The survey is very, very flexible. But one of the things that happens is that the survey gets overburdened. We're visiting the same people eight times and there's a limit to how many subjects we can include. We have to come back, and we have to do it quickly, trying to keep it to a 20-minute interview. Therefore, for other Federal agencies, we do what we call ad hoc surveys, totalling $50 million of work a year.

Some examples: The Census Bureau conducts the Health Interview Survey for the National Center for Health Statistics. This is a current weekly survey in which we measure the morbidity status of the population, hospitalization, cost of health

and medical care. For the Social Security Administration we've done surveys of the aged, the disabled, and new beneficiaries of different programs. We've done surveys on disabled veterans for the Veterans Administration to enable them to decide whether the Government benefits are adequate relative to today's living costs. For the Bureau of Sport Fisheries and Wildlife of the Interior Department, we've conducted surveys on recreation fishing and hunting.

Student: Is the CPS a name survey or an address survey?

Mr. Levine: The CPS is a survey of households. We go to a household for eight consecutive visits and if you live there for 3 months and then move, we pick up the family or individuals that move in. We don't follow individuals in this particular survey.

For OEO, when it existed, we did surveys on economic opportunity, poverty, participation in the community action programs, and opinions and attitudes towards government programs. As I mentioned, we conducted the Census Employment Survey which was a post-censal survey in ghetto areas.

The surveys I've mentioned are all snapshots of points in time. You can assimilate the analysis but you can't tell what happened to Miss Jones. Therefore, for the Labor Department and the Social Security Administration, we're doing what we call longitudinal surveys. We've selected a sample of individuals. In the case of the Manpower Administration, we're trying to look at what happens to people at different cycles in the labor market. For example, what happens to young people who are about to move into the labor market for the first time? We're following a sample of young women 30 to 44 years of age to see what happens to them as they go through their fertility period, leave the labor market, have their children, and come back into the labor market. We're dealing with men in their prime age groups to see what kind of mobility they have in the labor market.

We are doing surveys of people who are considerably older, 50 to 64, following them as they approach retirement, go through the process of retirement and move into the full retirement phase to see what kinds of social, psychological, and economic problems they have. This is to enable the Social Security Administration to develop legislation at the direction of the Congress, and change benefit programs to meet the needs of the population.

One major area that's relatively new for us is the area of criminal victimization. As a result of a tremendous interest and the intensity of concern which the Administration has had during the past 5 years, and with the establishment of the Law Enforcement Assistance Administration, the Census Bureau has moved very rapidly to include measures on criminal victimization in the household survey. Until the time this technique was employed, most of the evaluation of criminal activity was based on what's called the Uniform Crime Reports. These are basically administrative statistics and are developed by getting measures from each of the jurisdictions on the number of crimes reported.

There are a lot of problems in looking at administrative statistics, particularly in the criminal area. We have the problem that a lot of crimes are unreported to the police. Are they serious or not? They can well be serious if you're trying to plan a program developing measures to do something about the types of crimes that aren't reported. Why aren't they reported? Are people afraid of the police? That gives one insight immediately and may necessitate change, perhaps, as to community relations, or the perception of the police.

Secondly, are Uniform Crime Reports based on administrative records at the mercy of the local police department? I'm not trying to suggest that police departments are dishonest in any way, shape, or form, but there are problems there.

A patrolman caught a kid running away after knocking over a garbage can. One policeman may report it, the next policeman may not. These are very serious matters of concern.

There are instances where you see the crime statistics change because the police chief wants a larger budget and so he may increase crime. He may tell his policemen to report everything or he may change an administrative order. There are different problems of reporting among different jurisdictions. Some are more zealous in reporting exactly what's happening, thinking they're a better police force. Another city may not have the same view. And, of course, administrative reports do not provide data on personal and family characteristics or other victimizations that may have occurred. Although we ask about a variety of events, only certain crimes were selected for measurement. These are crimes against persons—rape, robbery and assault; crimes against property—burglary, larceny, auto theft, and robbery.

We are also trying to get a measure of business victimization, commercial victimization. And we are conducting surveys of inmates to find out what their socioeconomic characteristics were before they became incarcerated, how many times they've been incarcerated, what kind of work history they have. That, incidentally, is one of the major concerns with using Uniform Crime Reports as a source of data. We have a measure of criminal activity but we know nothing about the social, psychological, and economic impact of crime because the Uniform Crime Reports don't give the age, sex, marital status, family status, residence, length of time out of work, and the cost of victimization.

For the LEAA (Law Enforcement Assistance Administration), we're conducting continuing sample surveys of 70,000 households, over each 6-month period, to measure criminal victimization. We're looking at inmate, prison and jail statistics. We're doing surveys of the people in the criminal justice system to get some centralized information on the experience, training, and background of the people who are our law enforcement officers, to find out what training they need and what kinds of grants LEAA should give to local communities. We're doing evaluation studies to measure the structure before and after grants are given and programs implemented by local communities.

That gives some idea of the surveys we do. Let me mention just briefly a few other items that the Census Bureau does, in the other 9 years. We also produce population estimates and projections. We provide estimates of the population each month, its composition by age, sex, and geography. We provide population estimates for States and counties, and now we're trying to develop a methodology for providing current population estimates for the 39,000 local governments which are benefited under General Revenue Sharing, so that the apportionment formula which is now based on 1970 data will be more current and will reflect the fact that Los Angeles or Florida is growing very rapidly, but some other State is not growing or is losing population.

Student: Is there a bibliography or index stating what's available?

Mr. Levine: The Census catalog.[1] There are a tremendous number of reports, and the catalog gives you an indication of what the population gets for the money they put into the statistical system that we have developed.

I wanted to spend one moment to talk about a study that's been developed. This is a new indicator. Indicators come and indicators go. There are a lot of people around who say that unemployment isn't the same type of indicator it was 20 years ago. There are a lot more kids, marginal labor force members, moving in. Twenty-five years ago you had the male member of the household working and if he lost his job it was a very serious situation. Now you have a lot of families where the husband and wife both work. Kids are working. You have a lot of people who are working full time, year round, but earning less than $3,000 which puts them in a poverty status. This is an attempt to combine a series of data and attempt to take unemployment solely out of the context of being the indicator that it was before and tying it to a measure of need—trying to tie to unemployment the number of people who are working, but working less than full time for economic reasons, or who aren't earning a wage above the poverty level, or who may have been discouraged from looking. This is a new type of indicator which is now being considered.

There are quite a lot of people who have played around with what they call an Employment and Earning Inadequacy Index. The EEI is the merger of a number of CPS data series to produce a more meaningful measure of need with regard to the social situation in which we find ourselves today.

The Bureau also is now very much involved in revenue sharing, not just with General Revenue Sharing, but also with the Comprehensive Employment and Training Act, and the Elementary and Secondary Education Act, because all of these formulas inevitably contain somewhere in their legislation a little statement that says the Census Bureau shall provide current measures of whatever study is specified and we're frantically trying to gear up to produce current measures with the reliability that's necessary when money is to be distributed based on every single statistic.

It's a very difficult thing for the Bureau, and I think it's going to cause the Bureau a lot of problems in the next 4 or 5 years as we try to meet the needs. Certainly our job would be a lot easier had Congress in its infinite wisdom decided to sponsor a mid-decade sample survey or a mid-decade census. We are working very diligently to try to convince the Congress to authorize in 1985 a mid-decade census or large statistical survey. Then, you'd have 5-year benchmarks, and the accuracy of intercensal projections would be far improved than what we have when we have to deal with a 10-year period during which dramatic changes can occur, as the decade of the 1970's has shown.

I'll close with two general comments. I touched only briefly on the full scope of what the Census Bureau does. There are many surveys, many activities, that we do on a day-to-day basis that I haven't mentioned because of time constraints. But I do want to make one final point. Having spent a good deal of your time in telling you in effect that data are good for you, I feel somewhat compelled to point out (and I hope you don't consider me a traitor) that like medicine, more is not necessarily good; and it could possibly be harmful. What I mean by this is expressed in a statement I'd like to quote from a book review that I read last week. This happened to be a book on sex offenders, where the authors had compiled a tremendous amount of statistical data. I thought the reviewer made a very telling point, and one that should be kept in mind when using data. He wrote, "The reader is assaulted by an awesome mass of statistical detail but hardly any increase in understanding is likely to emerge from this mountain of detail or this fallout of facts. Facts can never speak for themselves, they must be made to speak, and no amount of accumulation of data can substitute for criteria which separate the trivial from the significant. There can be no democracy of facts in a mature scientific enterprise."

What I'm saying is that everybody has facts and facts are numbers on a piece of paper, but they don't mean anything until somebody with intelligence analyzes them and puts them in a meaningful context. They may not mean the same thing to everybody, but they do tell a story, and somebody has to tell that story. We can develop the mechanisms, we can produce the data, but the user, the person who looks at those data, has to bring his intelligence and analytical ability to the data as well. There are different philosophies, different outlooks, and merely putting out 3 million tables doesn't solve the world's problems.

My point then, use statistics, look at statistics, but look behind the data. First to see how they were produced, whether they're reliable, whether they're based on good sound statistical judgment, and then exercise your own native judgment.

[1] **Bureau of the Census Catalog,** available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, or any Department of Commerce district office.

UNITED STATES CENSUS

This is your Official Census Form

Please fill it out and mail it back on Census Day, Wednesday, April 1, 1970

	a1.	a2.	a3.	a4.	a5.

If the address shown above has the wrong apartment identification, please write the correct apartment number or location here:

How To Fill This Form

1. Use a black pencil to answer the questions.

This form is read by an electronic computer. Black pencil is better to use than ballpoint or other pens.

Fill circles "○" like this: ●

The electronic computer reads every circle you fill. If you fill the wrong circle, erase the mark completely, then fill the right circle.

When you write an answer, print or write clearly.

2. See the filled-in example on the yellow instruction sheet.

This example shows how to fill circles and write in answers. If you are not sure of an answer, give the best answer you can.

If you have a problem, look in the instruction sheet.

All instructions are numbered the same as the questions on the Census form.

If you need more help, call the Census office.

You can get the number of the local office from telephone "Information" or "Directory assistance."

3. Your answers are CONFIDENTIAL. The law (Title 13, United States Code) requires that you answer the questions to the best of your knowledge.

Your answers will be used only for statistical purposes and cannot, by law, be disclosed to any person outside the Census Bureau for any reason whatsoever.

The householder should make sure that the information is shown for everyone here.

If a boarder or roomer or anyone else prefers not to give the householder all his information to enter on the form, the householder should give at least his name, relationship, and sex in questions 1 to 3, then mail back the form. A Census Taker will call to get the rest of the information directly from the person.

4. Check your answers. Then, mail back this form on Wednesday, April 1, or as soon afterward as you can. Use the enclosed envelope; no stamp is needed.

Your cooperation in carefully filling out the form and mailing it back will help make the census successful. It will save the government the expense of calling on you for the information.

PLEASE CONTINUE

U.S. Department of Commerce
Bureau of the Census
Form D-60

Page 1, con.

5. Answer the questions in this order:

Questions on page 2 about the people in your household.

Questions on page 3 about your house or apartment.

6. In Question 1 on page 2, please list each person who was living here on Wednesday, April 1, 1970, or who was staying or visiting here and had no other home.

EXPLANATORY NOTES

This leaflet shows the content of the 1970 census questionnaires. The content was determined after review of the 1960 census experience, extensive consultation with many government and private users of census data, and a series of experimental censuses in which various alternatives were tested.

Three questionnaires are being used in the census and each household has an equal chance of answering a particular form.

80 percent of the households answer a form containing only the questions on pages 2 and 3 of this leaflet.

15 percent and **5 percent** of the households answer forms which also contain the specified questions on the remaining pages of this leaflet. The 15-percent form does not show the 5-percent questions, and the 5-percent form does not show the 15-percent questions. On both forms, population questions 13 to 41 are repeated for each person in the household but questions 24 to 41 do not apply to children under 14 years of age.

The same sets of questions are used throughout the country, regardless of whether the census in a particular area is conducted by mail or house-to-house canvass. An illustrative example is enclosed with each questionnaire to help the householder complete the form.

Page 2

DO NOT MARK THIS COLUMN	Line No.	1. WHAT IS THE NAME OF EACH PERSON who was living here on Wednesday, April 1, 1970 or who was staying or visiting here and had no other home? Print names in this order: Head of the household; Wife of head; Unmarried children, oldest first; Married children and their families; Other relatives of the head; Persons not related to the head	2. HOW IS EACH PERSON RELATED TO THE HEAD OF THIS HOUSEHOLD? Fill one circle. If "Other relative of head," also give exact relationship, for example, mother-in-law, brother, niece, grandson, etc. If "Other not related to head," also give exact relationship, for example, partner, maid, etc.
	1	Last name / First name / Middle initial	○ Head of household ○ Wife of head ○ Son or daughter of head ○ Other relative of head—Print exact relationship → ○ Roomer, boarder, lodger ○ Patient or inmate ○ Other not related to head—Print exact relationship
	2	Last name / First name / Middle initial	○ Head of household ○ Wife of head ○ Son or daughter of head ○ Other relative of head—Print exact relationship → ○ Roomer, boarder, lodger ○ Patient or inmate ○ Other not related to head—Print exact relationship
	3	Last name / First name / Middle initial	○ Head of household ○ Wife of head ○ Son or daughter of head ○ Other relative of head—Print exact relationship → ○ Roomer, boarder, lodger ○ Patient or inmate ○ Other not related to head—Print exact relationship
	4	Last name / First name / Middle initial	○ Head of household ○ Wife of head ○ Son or daughter of head ○ Other relative of head—Print exact relationship → ○ Roomer, boarder, lodger ○ Patient or inmate ○ Other not related to head—Print exact relationship
	5	Last name / First name / Middle initial	○ Head of household ○ Wife of head ○ Son or daughter of head ○ Other relative of head—Print exact relationship → ○ Roomer, boarder, lodger ○ Patient or inmate ○ Other not related to head—Print exact relationship
	6	Last name / First name / Middle initial	○ Head of household ○ Wife of head ○ Son or daughter of head ○ Other relative of head—Print exact relationship → ○ Roomer, boarder, lodger ○ Patient or inmate ○ Other not related to head—Print exact relationship
	7	Last name / First name / Middle initial	○ Head of household ○ Wife of head ○ Son or daughter of head ○ Other relative of head—Print exact relationship → ○ Roomer, boarder, lodger ○ Patient or inmate ○ Other not related to head—Print exact relationship
	8	Last name / First name / Middle initial	○ Head of household ○ Wife of head ○ Son or daughter of head ○ Other relative of head—Print exact relationship → ○ Roomer, boarder, lodger ○ Patient or inmate ○ Other not related to head—Print exact relationship

9. *If you used all 8 lines* —**Are there any other persons in this household?** ○ Yes ○ No → *Do not list the others; we will call to get the information.*

10. Did you leave anyone out of Question 1 because you were not sure if he should be listed—for example, a new baby still in the hospital, or a lodger who also has another home? ○ Yes ○ No → *On back page, give name(s) and reason left out.*

Page 2, con.

3. SEX	4. COLOR OR RACE	DATE OF BIRTH			8. WHAT IS EACH PERSON'S MARITAL STATUS?
		5. Month and year of birth and age last birthday	6. Month of birth	7. Year of birth	
Fill one circle	*Fill one circle.* *If "Indian (American)," also give tribe.* *If "Other," also give race.*	*Print*	*Fill one circle*	*Fill one circle for first three numbers* / *Fill one circle for last number*	*Fill one circle*
○ Male ○ Female	○ White ○ Japanese ○ Hawaiian ○ Chinese ○ Korean ○ Negro or Black ○ Filipino ○ Other– *Print race* ○ Indian (Amer.) *Print tribe* →	Month Year Age	○ Jan.-Mar. ○ Apr.-June ○ July-Sept. ○ Oct.-Dec.	○ 186- ○ 192- / ○ 0 ○ 5 ○ 187- ○ 193- / ○ 1 ○ 6 ○ 188- ○ 194- / ○ 2 ○ 7 ○ 189- ○ 195- / ○ 3 ○ 8 ○ 190- ○ 196- / ○ 4 ○ 9 ○ 191- ○ 197-	○ Now married ○ Widowed ○ Divorced ○ Separated ○ Never married
○ Male ○ Female	○ White ○ Japanese ○ Hawaiian ○ Chinese ○ Korean ○ Negro or Black ○ Filipino ○ Other– *Print race* ○ Indian (Amer.) *Print tribe* →	Month Year Age	○ Jan.-Mar. ○ Apr.-June ○ July-Sept. ○ Oct.-Dec.	○ 186- ○ 192- / ○ 0 ○ 5 ○ 187- ○ 193- / ○ 1 ○ 6 ○ 188- ○ 194- / ○ 2 ○ 7 ○ 189- ○ 195- / ○ 3 ○ 8 ○ 190- ○ 196- / ○ 4 ○ 9 ○ 191- ○ 197-	○ Now married ○ Widowed ○ Divorced ○ Separated ○ Never married
○ Male ○ Female	○ White ○ Japanese ○ Hawaiian ○ Chinese ○ Korean ○ Negro or Black ○ Filipino ○ Other– *Print race* ○ Indian (Amer.) *Print tribe* →	Month Year Age	○ Jan.-Mar. ○ Apr.-June ○ July-Sept. ○ Oct.-Dec.	○ 186- ○ 192- / ○ 0 ○ 5 ○ 187- ○ 193- / ○ 1 ○ 6 ○ 188- ○ 194- / ○ 2 ○ 7 ○ 189- ○ 195- / ○ 3 ○ 8 ○ 190- ○ 196- / ○ 4 ○ 9 ○ 191- ○ 197-	○ Now married ○ Widowed ○ Divorced ○ Separated ○ Never married
○ Male ○ Female	○ White ○ Japanese ○ Hawaiian ○ Chinese ○ Korean ○ Negro or Black ○ Filipino ○ Other– *Print race* ○ Indian (Amer.) *Print tribe* →	Month Year Age	○ Jan.-Mar. ○ Apr.-June ○ July-Sept. ○ Oct.-Dec.	○ 186- ○ 192- / ○ 0 ○ 5 ○ 187- ○ 193- / ○ 1 ○ 6 ○ 188- ○ 194- / ○ 2 ○ 7 ○ 189- ○ 195- / ○ 3 ○ 8 ○ 190- ○ 196- / ○ 4 ○ 9 ○ 191- ○ 197-	○ Now married ○ Widowed ○ Divorced ○ Separated ○ Never married
○ Male ○ Female	○ White ○ Japanese ○ Hawaiian ○ Chinese ○ Korean ○ Negro or Black ○ Filipino ○ Other– *Print race* ○ Indian (Amer.) *Print tribe* →	Month Year Age	○ Jan.-Mar. ○ Apr.-June ○ July-Sept. ○ Oct.-Dec.	○ 186- ○ 192- / ○ 0 ○ 5 ○ 187- ○ 193- / ○ 1 ○ 6 ○ 188- ○ 194- / ○ 2 ○ 7 ○ 189- ○ 195- / ○ 3 ○ 8 ○ 190- ○ 196- / ○ 4 ○ 9 ○ 191- ○ 197-	○ Now married ○ Widowed ○ Divorced ○ Separated ○ Never married
○ Male ○ Female	○ White ○ Japanese ○ Hawaiian ○ Chinese ○ Korean ○ Negro or Black ○ Filipino ○ Other– *Print race* ○ Indian (Amer.) *Print tribe* →	Month Year Age	○ Jan.-Mar. ○ Apr.-June ○ July-Sept. ○ Oct.-Dec.	○ 186- ○ 192- / ○ 0 ○ 5 ○ 187- ○ 193- / ○ 1 ○ 6 ○ 188- ○ 194- / ○ 2 ○ 7 ○ 189- ○ 195- / ○ 3 ○ 8 ○ 190- ○ 196- / ○ 4 ○ 9 ○ 191- ○ 197-	○ Now married ○ Widowed ○ Divorced ○ Separated ○ Never married
○ Male ○ Female	○ White ○ Japanese ○ Hawaiian ○ Chinese ○ Korean ○ Negro or Black ○ Filipino ○ Other– *Print race* ○ Indian (Amer.) *Print tribe* →	Month Year Age	○ Jan.-Mar. ○ Apr.-June ○ July-Sept. ○ Oct.-Dec.	○ 186- ○ 192- / ○ 0 ○ 5 ○ 187- ○ 193- / ○ 1 ○ 6 ○ 188- ○ 194- / ○ 2 ○ 7 ○ 189- ○ 195- / ○ 3 ○ 8 ○ 190- ○ 196- / ○ 4 ○ 9 ○ 191- ○ 197-	○ Now married ○ Widowed ○ Divorced ○ Separated ○ Never married

Make no mark in this margin

11. Did you list anyone in Question 1 who is away from home now—for example, on a vacation or in a hospital?	○ Yes ○ No *On back page, give name(s) and reason person is away.*	12. Did anyone stay here on Tuesday, March 31, who is not already listed?	○ Yes ○ No *On back page, give name of each visitor for whom there is no one at his home address to report him to a census taker.*

26:1

Please answer questions 10, 11, and 12 at the bottom of page 2.

80, 15, and 5 percent (100 percent)

A. How many living quarters, occupied and vacant, are at this address?

- One
- 2 apartments or living quarters
- 3 apartments or living quarters
- 4 apartments or living quarters
- 5 apartments or living quarters
- 6 apartments or living quarters
- 7 apartments or living quarters
- 8 apartments or living quarters
- 9 apartments or living quarters
- 10 or more apartments or living quarters
- This is a mobile home or trailer

Answer these questions for your living quarters

H1. Is there a telephone on which people in your living quarters can be called?

- Yes → What is the number? _____ *Phone number*
- No

H2. Do you enter your living quarters—

- Directly from the outside or through a common or public hall?
- Through someone else's living quarters?

H3. Do you have complete kitchen facilities?
Complete kitchen facilities are a sink with piped water, a range or cook stove, and a refrigerator.

- Yes, for this household only
- Yes, but also used by another household
- No complete kitchen facilities for this household

H4. How many rooms do you have in your living quarters?
Do not count bathrooms, porches, balconies, foyers, halls, or half-rooms.

- 1 room
- 2 rooms
- 3 rooms
- 4 rooms
- 5 rooms
- 6 rooms
- 7 rooms
- 8 rooms
- 9 rooms or more

H5. Is there hot and cold piped water in this building?

- Yes, hot and cold piped water in this building
- No, only cold piped water in this building
- No piped water in this building

H6. Do you have a flush toilet?

- Yes, for this household only
- Yes, but also used by another household
- No flush toilet

H7. Do you have a bathtub or shower?

- Yes, for this household only
- Yes, but also used by another household
- No bathtub or shower

H8. Is there a basement in this building?

- Yes
- No, built on a concrete slab
- No, built in another way *(include mobile homes and trailers)*

H9. Are your living quarters—

- Owned or being bought by you or by someone else in this household? *Do not include cooperatives and condominiums here.*
- A cooperative or condominium which is owned or being bought by you or by someone else in this household?
- Rented for cash rent?
- Occupied without payment of cash rent?

H10a. Is this building a one-family house?

- Yes, a one-family house
- No, a building for 2 or more families or a mobile home or trailer

b. *If "Yes"*— Is this house on a place of 10 acres or more, or is any part of this property used as a commercial establishment or medical office?

- Yes, 10 acres or more
- Yes, commercial establishment or medical office
- No, none of the above

H11. *If you live in a one-family house which you own or are buying*—
What is the value of this property; that is, how much do you think this property (house and lot) would sell for if it were for sale?

- Less than $5,000
- $5,000 to $7,499
- $7,500 to $9,999
- $10,000 to $12,499
- $12,500 to $14,999
- $15,000 to $17,499
- $17,500 to $19,999
- $20,000 to $24,999
- $25,000 to $34,999
- $35,000 to $49,999
- $50,000 or more

If this house is on a place of 10 acres or more, or if any part of this property is used as a commercial establishment or medical office, do not answer this question.

H12. *Answer this question if you pay rent for your living quarters.*

a. *If rent is paid by the month*—
What is the monthly rent?

Write amount here → $ _____ .00 *(Nearest dollar)*

and

Fill one circle

- Less than $30
- $30 to $39
- $40 to $49
- $50 to $59
- $60 to $69
- $70 to $79
- $80 to $89
- $90 to $99
- $100 to $119
- $120 to $149
- $150 to $199
- $200 to $249
- $250 to $299
- $300 or more

b. *If rent is not paid by the month*—
What is the rent, and what period of time does it cover?

$ _____ .00 per _____
(Nearest dollar) *(Week, half-month, year, etc.)*

FOR CENSUS ENUMERATOR'S USE ONLY

a4. Block number

a5. Serial number

	a4	a5
Ø	Ø	Ø
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

Make no mark in this margin

B. Type of unit or quarters

Occupied
- First form
- Continuation

Vacant
- Regular
- Usual residence elsewhere

Group quarters
- First form
- Continuation

For a vacant unit, also fill C, D, A, H2 to H8, and H10 to H12

C. Vacancy status

Year round—
- For rent
- For sale only
- Rented or sold, not occupied
- Held for occasional use
- Other vacant

- Seasonal
- Migratory

Make no mark in this margin

D. Months vacant

- Less than 1 month
- 1 up to 2 months
- 2 up to 6 months
- 6 up to 12 months
- 1 year up to 2 years
- 2 years or more

C/O

Page 4

H13. *Answer question H13 if you pay rent for your living quarters.*

In addition to the rent entered in H12, do you also pay for—

a. **Electricity?**
- ○ Yes, average monthly cost is → $ _____.00 *Average monthly cost*
- ○ No, included in rent
- ○ No, electricity not used

b. **Gas?**
- ○ Yes, average monthly cost is → $ _____.00 *Average monthly cost*
- ○ No, included in rent
- ○ No, gas not used

c. **Water?**
- ○ Yes, yearly cost is → $ _____.00 *Yearly cost*
- ○ No, included in rent or no charge

d. **Oil, coal, kerosene, wood, etc.?**
- ○ Yes, yearly cost is → $ _____.00 *Yearly cost*
- ○ No, included in rent
- ○ No, these fuels not used

H14. **How are your living quarters heated?**
Fill one circle for the kind of heat you use most.
- ○ Steam or hot water system
- ○ Central warm air furnace with ducts to the individual rooms, or central heat pump
- ○ Built-in electric units *(permanently installed in wall, ceiling, or baseboard)*
- ○ Floor, wall, or pipeless furnace
- ○ Room heaters with flue or vent, burning gas, oil, or kerosene
- ○ Room heaters without flue or vent, burning gas, oil, or kerosene *(not portable)*
- ○ Fireplaces, stoves, or portable room heaters of any kind
- In some other way—*Describe* → _____
- ○ None, unit has no heating equipment

15 and 5 percent

H15. **About when was this building originally built?** *Mark when the building was first constructed, not when it was remodeled, added to, or converted.*
- ○ 1969 or 1970
- ○ 1965 to 1968
- ○ 1960 to 1964
- ○ 1950 to 1959
- ○ 1940 to 1949
- ○ 1939 or earlier

H16. **Which best describes this building?**
Include all apartments, flats, etc., even if vacant.
- ○ A one-family house detached from any other house
- ○ A one-family house attached to one or more houses
- ○ A building for 2 families
- ○ A building for 3 or 4 families
- ○ A building for 5 to 9 families
- ○ A building for 10 to 19 families
- ○ A building for 20 to 49 families
- ○ A building for 50 or more families
- ○ A mobile home or trailer
- Other—*Describe* _____

H17. **Is this building—**
- ○ On a city or suburban lot?— *Skip to H19*
- ○ On a place of less than 10 acres?
- ○ On a place of 10 acres or more?

H18. **Last year, 1969, did sales of crops, livestock, and other farm products from this place amount to—**
- ○ Less than $50 (or None)
- ○ $50 to $249
- ○ $250 to $2,499
- ○ $2,500 to $4,999
- ○ $5,000 to $9,999
- ○ $10,000 or more

H19. **Do you get water from—**
- ○ A public system *(city water department, etc.)* or private company?
- ○ An individual well?
- ○ Some other source *(a spring, creek, river, cistern, etc.)*?

H20. **Is this building connected to a public sewer?**
- ○ Yes, connected to public sewer
- ○ No, connected to septic tank or cesspool
- ○ No, use other means

H21. **How many bathrooms do you have?**
A complete bathroom is a room with flush toilet, bathtub or shower, and wash basin with piped water.

A half bathroom has at least a flush toilet or bathtub or shower, but does not have all the facilities for a complete bathroom.
- ○ No bathroom, or only a half bathroom
- ○ 1 complete bathroom
- ○ 1 complete bathroom, plus half bath(s)
- ○ 2 complete bathrooms
- ○ 2 complete bathrooms, plus half bath(s)
- ○ 3 or more complete bathrooms

H22. **Do you have air-conditioning?**
- ○ Yes, 1 individual room unit
- ○ Yes, 2 or more individual room units
- ○ Yes, a central air-conditioning system
- ○ No

H23. **How many passenger automobiles are owned or regularly used by members of your household?**
Count company cars kept at home.
- ○ None
- ○ 1 automobile
- ○ 2 automobiles
- ○ 3 automobiles or more

15 percent

H24a. How many stories (floors) are in this building?

- 1 to 3 stories
- 4 to 6 stories
- 7 to 12 stories
- 13 stories or more

b. *If 4 or more stories—*
Is there a passenger elevator in this building?

Yes No

H25a. Which fuel is used most for cooking?

Gas — From underground pipes serving the neighborhood.		Coal or coke	
Gas — Bottled, tank, or LP		Wood	
Electricity		Other fuel	
Fuel oil, kerosene, etc.		No fuel used	

b. Which fuel is used most for house heating?

Gas — From underground pipes serving the neighborhood.		Coal or coke	
Gas — Bottled, tank, or LP		Wood	
Electricity		Other fuel	
Fuel oil, kerosene, etc.		No fuel used	

c. Which fuel is used most for water heating?

Gas — From underground pipes serving the neighborhood.		Coal or coke	
Gas — Bottled, tank, or LP		Wood	
Electricity		Other fuel	
Fuel oil, kerosene, etc.		No fuel used	

H26. How many bedrooms do you have?
Count rooms used mainly for sleeping even if used also for other purposes.

- No bedroom
- 1 bedroom
- 2 bedrooms
- 3 bedrooms
- 4 bedrooms
- 5 bedrooms or more

H27a. Do you have a clothes washing machine?

- Yes, automatic or semi-automatic
- Yes, wringer or separate spinner
- No

b. Do you have a clothes dryer?

- Yes, electrically heated
- Yes, gas heated
- No

c. Do you have a dishwasher *(built-in or portable)*?

Yes No

d. Do you have a home food freezer which is separate from your refrigerator?

Yes No

H28a. Do you have a television set? *Count only sets in working order.*

- Yes, one set
- Yes, two or more sets
- No

b. *If "Yes"—* Is any set equipped to receive UHF broadcasts, that is, channels 14 to 83?

Yes No

H29. Do you have a battery-operated radio?
Count car radios, transistors, and other battery-operated sets in working order or needing only a new battery for operation.

Yes, one or more No

H30. Do you (or any member of your household) own a second home or other living quarters which you occupy sometime during the year?

Yes No

5 percent

Page 6

The 15-percent and 5-percent forms contain a pair of facing pages for each person in the household (as listed on page 2). Shown on each pair of pages in the 15-percent form are the questions designated as 15-percent here on pages 6, 7, and 8. Shown on each pair of pages in the 5-percent form are the questions designated as 5-percent here on pages 6, 7, and 8.

Name of person on line (1) of page 2

Last name First name Initial

13a. Where was this person born? *If born in hospital, give State or country where mother lived. If born outside U.S., see instruction sheet; distinguish Northern Ireland from Ireland (Eire).*

15 and 5 percent

- ○ This State

OR

(Name of State or foreign country; or Puerto Rico, Guam, etc.)

b. Is this person's origin or descent— *(Fill one circle)*

5 percent

- ○ Mexican
- ○ Puerto Rican
- ○ Cuban
- ○ Central or South American
- ○ Other Spanish
- ○ No, none of these

14. What country was his father born in?

15 percent

- ○ United States

OR

(Name of foreign country; or Puerto Rico, Guam, etc.)

15. What country was his mother born in?

- ○ United States

OR

(Name of foreign country; or Puerto Rico, Guam, etc.)

16. *For persons born in a foreign country—*

a. Is this person naturalized?

5 percent

- ○ Yes, naturalized
- ○ No, alien
- ○ Born abroad of American parents

b. When did he come to the United States to stay?

- ○ 1965 to 70
- ○ 1960 to 64
- ○ 1955 to 59
- ○ 1950 to 54
- ○ 1945 to 49
- ○ 1935 to 44
- ○ 1925 to 34
- ○ 1915 to 24
- ○ Before 1915

17. What language, other than English, was spoken in this person's home when he was a child? *Fill one circle.*

- ○ Spanish
- ○ French
- ○ German
- ○ Other— *Specify* _____
- ○ None, English only

18. When did this person move into this house (or apartment)? *Fill circle for date of last move.*

15 percent

- ○ 1969 or 70
- ○ 1968
- ○ 1967
- ○ 1965 or 66
- ○ 1960 to 64
- ○ 1950 to 59
- ○ 1949 or earlier
- ○ Always lived in this house or apartment

19a. Did he live in this house on April 1, 1965? *If in college or Armed Forces in April 1965, report place of residence there.*

- ○ Born April 1965 or later
- ○ Yes, this house ..... } *Skip to 20*
- ○ No, different house

b. Where did he live on April 1, 1965?

(1) State, foreign country, U.S. possession, etc. _____

(2) County _____

(3) Inside the limits of a city, town, village, etc.?

○ Yes ○ No

(4) *If "Yes,"* name of city, town, village, etc. _____

20. Since February 1, 1970, has this person attended regular school or college at any time? *Count nursery school, kindergarten, and schooling which leads to an elementary school certificate, high school diploma, or college degree.*

15 percent

- ○ No
- ○ Yes, public
- ○ Yes, parochial
- ○ Yes, other private

21. What is the highest grade (or year) of regular school he has ever attended?

Fill one circle. If now attending, mark grade he is in.

15 and 5 percent

- ○ Never attended school— *Skip to 23*
- ○ Nursery school
- ○ Kindergarten

Elementary through high school (grade or year)

1 2 3 4 5 6 7 8 9 10 11 12

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

College (academic year)

1 2 3 4 5 6 or more

○ ○ ○ ○ ○ ○

22. Did he finish the highest grade (or year) he attended?

- ○ Now attending this grade (or year)
- ○ Finished this grade (or year)
- ○ Did not finish this grade (or year)

23. When was this person born?

- ○ Born before April 1956— *Please go on with questions 24 through 41.*
- ○ Born April 1956 or later— *Please omit questions 24 through 41 and go to the next page for the next person.*

24. *If this person has ever been married—*

a. Has this person been married more than once?

5 percent

- ○ Once
- ○ More than once

b. When did he get married? _____ *Month* _____ *Year*

When did he get married for the first time? _____ *Month* _____ *Year*

c. *If married more than once—* **Did the first marriage end because of the death of the husband (or wife)?**

○ Yes ○ No

25. *If this is a girl or a woman—*

How many babies has she ever had, not counting stillbirths? *Do not count her stepchildren or children she has adopted.*

15 and 5 percent

1 2 3 4 5 6 7 8 9 10 11 12 or more None

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

26. *If this is a man—*

a. Has he ever served in the Army, Navy, or other Armed Forces of the United States?

15 percent

- ○ Yes
- ○ No

b. Was it during— *(Fill the circle for each period of service.)*

- Vietnam Conflict *(Since Aug. 1964)* ..... ○
- Korean War *(June 1950 to Jan. 1955)* ..... ○
- World War II *(Sept. 1940 to July 1947)* ..... ○
- World War I *(April 1917 to Nov. 1918)* ..... ○
- Any other time ..... ○

5 percent

27a. Has this person ever completed a vocational training program?
For example, in high school; as apprentice; in school of business, nursing, or trades; technical institute; or Armed Forces schools.

○ Yes ○ No— *Skip to 28*

b. What was his main field of vocational training? *Fill one circle.*

- ○ Business, office work
- ○ Nursing, other health fields
- ○ Trades and crafts *(mechanic, electrician, beautician, etc.)*
- ○ Engineering or science technician; draftsman
- ○ Agriculture or home economics
- ○ Other field— *Specify*

28a. Does this person have a health or physical condition which limits the kind or amount of work he can do at a job?
If 65 years old or over, skip to question 29.

- ○ Yes
- ○ No

b. Does his health or physical condition keep him from holding any job at all?

- ○ Yes
- ○ No

c. *If "Yes" in a or b—* **How long has he been limited in his ability to work?**

- ○ Less than 6 months
- ○ 6 to 11 months
- ○ 1 to 2 years
- ○ 3 to 4 years
- ○ 5 to 9 years
- ○ 10 years or more

15 and 5 percent

QUESTIONS 29 THROUGH 41 ARE FOR ALL PERSONS BORN BEFORE APRIL 1956 INCLUDING HOUSEWIVES, STUDENTS, OR DISABLED PERSONS AS WELL AS PART-TIME OR FULL-TIME WORKERS

29a. Did this person work at any time last week?

○ Yes– *Fill this circle if this person did full- or part-time work. (Count part-time work such as a Saturday job, delivering papers, or helping without pay in a family business or farm; and active duty in the Armed Forces)*

○ No– *Fill this circle if this person did not work, or did only own housework, school work, or volunteer work.*

Skip to 30

b. How many hours did he work last week (at all jobs)?
Subtract any time off and add overtime or extra hours worked.

- ○ 1 to 14 hours
- ○ 15 to 29 hours
- ○ 30 to 34 hours
- ○ 35 to 39 hours
- ○ 40 hours
- ○ 41 to 48 hours
- ○ 49 to 59 hours
- ○ 60 hours or more

15 percent

c. Where did he work last week?
If he worked in more than one place, print where he worked most last week.
If he travels about in his work or if the place does not have a numbered address, see instruction sheet.

(1) Address *(Number and street name)* _____

(2) Name of city, town, village, etc. _____

(3) Inside the limits of this city, town, village, etc.?
- ○ Yes
- ○ No

(4) County _____

(5) State (6) ZIP Code _____

d. How did he get to work last week? *Fill one circle for chief means used on the last day he worked at the address given in 29c.*

- ○ Driver, private auto
- ○ Passenger, private auto
- ○ Bus or streetcar
- ○ Subway or elevated
- ○ Railroad
- ○ Taxicab
- ○ Walked only
- ○ Worked at home
- ○ Other means— *Specify*

After completing question 29d, skip to question 33

15 and 5 percent

30. Does this person have a job or business from which he was temporarily absent or on layoff last week?

- ○ Yes, on layoff
- ○ Yes, on vacation, temporary illness, labor dispute, etc.
- ○ No

31a. Has he been looking for work during the past 4 weeks?

○ Yes ○ No— *Skip to 32*

b. Was there any reason why he could not take a job last week?

- ○ Yes, already has a job
- ○ Yes, because of this person's temporary illness
- ○ Yes, for other reasons (in school, etc.)
- ○ No, could have taken a job

32. When did he last work at all, even for a few days?

- ○ In 1970
- ○ In 1969
- ○ In 1968
- ○ 1964 to 1967
- ○ 1960 to 1963
- ○ 1959 or earlier
- ○ Never worked

Skip to 36

– continued –

Page 8

33–35. Current or most recent job activity

Describe clearly this person's chief job activity or business last week, if any. If he had more than one job, describe the one at which he worked the most hours.

If this person had no job or business last week, give information for last job or business since 1960.

33. Industry

a. For whom did he work? *If now on active duty in the Armed Forces, print "AF" and skip to question 36.*

(Name of company, business, organization, or other employer)

b. What kind of business or industry was this?
Describe activity at location where employed.

(For example: Junior high school, retail supermarket, dairy farm, TV and radio service, auto assembly plant, road construction)

c. Is this mainly— *(Fill one circle)*

○ Manufacturing ○ Retail trade
○ Wholesale trade ○ Other *(agriculture, construction, service, government, etc.)*

15 and 5 percent

34. Occupation

a. What kind of work was he doing?

(For example: TV repairman, sewing machine operator, spray painter, civil engineer, farm operator, farm hand, junior high English teacher)

b. What were his most important activities or duties?

(For example: Types, keeps account books, files, sells cars, operates printing press, cleans buildings, finishes concrete)

c. What was his job title?

35. Was this person— *(Fill one circle)*

Employee of private company, business, or individual, for wages, salary, or commissions... ○

Federal government employee ..... ○
State government employee..... ○
Local government employee *(city, county, etc.)*... ○

Self-employed in own business, professional practice, or farm—
Own business not incorporated ..... ○
Own business incorporated ..... ○

Working without pay in family business or farm ○

5 percent

36. In April 1965, what State did this person live in?

○ This State

OR

(Name of State or foreign country; or Puerto Rico, etc.)

37. In April 1965, was this person— *(Fill three circles)*

a. Working at a job or business *(full or part-time)?*
○ Yes ○ No

b. In the Armed Forces?
○ Yes ○ No

c. Attending college?
○ Yes ○ No

15 and 5 percent

38. *If "Yes" for "Working at a job or business" in question 37—* **Describe this person's chief activity or business in April 1965.**

a. What kind of business or industry was this?

b. What kind of work was he doing (occupation)?

c. Was he—
An employee of a private company or government agency... ○
Self-employed or an unpaid family worker ..... ○

5 percent

39a. Last year (1969), did this person work at all, even for a few days?
○ Yes ○ No— *Skip to 41*

b. How many weeks did he work in 1969, either full-time or part-time?
Count paid vacation, paid sick leave, and military service.

○ 13 weeks or less ○ 40 to 47 weeks
○ 14 to 26 weeks ○ 48 to 49 weeks
○ 27 to 39 weeks ○ 50 to 52 weeks

40. Earnings in 1969— *Fill parts a, b, and c for everyone who worked any time in 1969 even if he had no income.*
(If exact amount is not known, give best estimate.)

a. How much did this person earn in 1969 in wages, salary, commissions, bonuses, or tips from all jobs?
(Before deductions for taxes, bonds, dues, or other items.)
$ _____.00 *(Dollars only)*
OR ○ None

b. How much did he earn in 1969 from his own nonfarm business, professional practice, or partnership?
(Net after business expenses. If business lost money, write "Loss" above amount.)
$ _____.00 *(Dollars only)*
OR ○ None

c. How much did he earn in 1969 from his own farm?
(Net after operating expenses. Include earnings as a tenant farmer or sharecropper. If farm lost money, write "Loss" above amount.)
$ _____.00 *(Dollars only)*
OR ○ None

15 and 5 percent

41. Income other than earnings in 1969— *Fill parts a, b, and c.*
(If exact amount is not known, give best estimate.)

a. How much did this person receive in 1969 from Social Security or Railroad Retirement?
$ _____.00 *(Dollars only)*
OR ○ None

b. How much did he receive in 1969 from public assistance or welfare payments?
Include aid for dependent children, old age assistance, general assistance, aid to the blind or totally disabled. Exclude separate payments for hospital or other medical care.
$ _____.00 *(Dollars only)*
OR ○ None

c. How much did he receive in 1969 from all other sources?
Include interest, dividends, veterans' payments, pensions, and other regular payments. (See instruction sheet.)
$ _____.00 *(Dollars only)*
OR ○ None

GPO : 1972 O - 477-628

FORM CPS-260 (6-10-74) — U.S. DEPARTMENT OF COMMERCE — SESA BUREAU OF THE CENSUS

CURRENT POPULATION SURVEY CONTROL CARD

NOTICE – Your report to the Census Bureau is confidential by law (Title 13, U.S. Code). It may be seen only by sworn Census employees and may be used only for statistical purposes.

FORM APPROVED: O.M.B. No. 41-R1201

1. 1st month letter sent Y N | 2. 5th month letter sent Y N | 3. HOUSEHOLD ND. | 4. SEGMENT TYPE ☐ Area ☐ Address ☐ Permit ☐ Cen–Sup ☐ Sp. Pl. | 5. SAMPLE | 6. CONTROL NUMBER PSU / Segment / Serial No.

7a. ADDRESS (Sheet ___ Line ___) What is your exact address? *(Include House No., St., Apt. No., or other identification)*

Place, State, ZIP code

7b. Is this your mailing address? *(Enter "Same" or specify if different. Include ZIP code.)*

7c Special place name | Type code | Sample No.

ASK DURING 1st AND 5th MONTHS OF ENUMERATION

AREA SEGMENTS ONLY

7d. YEAR BUILT — ☐ Ask 1st mo. ☐ Do NOT ask

When was this structure originally built?
- ☐ Before 4-1-70 *(Cont. interview)*
- ☐ After 4-1-70 *(Complete 8c when required, end interview)*

8. ASK (in 1st and 5th month):

	1st month	5th month
a. Are there any occupied or vacant living quarters besides your own in this building?	Y ☐ N ☐ *Fill Table X*	Y ☐ N ☐ *Fill Table X*
b. Are there any occupied or vacant living quarters besides your own on this floor?	Y ☐ N ☐ *Fill Table X*	Y ☐ N ☐ *Fill Table X*
c. Is there any other building on this property for people to live in – either occupied or vacant?	Y ☐ N ☐ *Fill Table X*	Y ☐ N ☐ *Fill Table X*
d. None		

9. TENURE — Are your living quarters –

	1st	5th
Owned or being bought by you or someone in your household?	☐	☐
Rented for cash?	☐	☐
Occupied without payment of cash rent?	☐	☐

10a. – 12. LAND USE 10a. ☐ RURAL ☐ URBAN (A) *(Skip to C.C. item 14a)*
– Reg. units and Sp. pl. units coded 85-88 in item 7c, ask 10b
– Sp. pl. not coded 85-88 in 7c *skip to cc item 14a*

	1st	5th
10b. You told me your living quarters are *(Read entry in Control Card item 9)* Does this place you (own rent) have 10 acres or more?	Y ☐ N ☐ *(Ask 11) (Ask 12)*	Y ☐ N ☐ *(Ask 11) (Ask 12)*
11. During the past 12 months, did sales of crops, livestock and other farm products from this place amount to $50 or more?	Y N (B) (D)	Y N (B) (D)
12. During the past 12 months, did sales of crops, livestock and other farm products from this place amount to $250 or more?	Y N (C) (E)	Y N (C) (E)

NOTE TRANSCRIBE FINAL CODE (A, B, C, D, E) TO CPS-1, ITEM 5.

FOR PERSONS WITH "YES" IN ITEM 14C

Line number / Circle Line No. of resp.	NAME (last name first) — What is the name of the head of this household? What are the names of all other persons who are living or staying here? (List all persons staying here and all persons who usually live here who are absent. Be sure to INCLUDE infants under 1 year of age.) 14a.	RELATIONSHIP TO HOUSEHOLD HEAD — Example: head, wife, son, daughter-in-law, partner, lodger, lodger's wife, etc.) 14b.	HOUSEHOLD MEMBER — Circle Y – Yes or N – No 14c.	What is . . .'s date of birth? *Enter in numerals* — Month 17a.	Date 17b.	Year 17c.	AGE LAST BIRTHDAY — Enter age as of end of survey week. If under 1 year of age, enter "0." 18a.	Month and year of age change *Enter in numerals* — 18b	18c	18d	18e	MARITAL STATUS — Is . . . now married, widowed, divorced, separated, or has . . . never been married? *M., Wd., D., Sep., or NM* 19.	RACE — *Circle W., Neg., or Ot.* 20.	SEX — *Circle M – Male or F – Female* 21.	MALES 14 YRS. AND OVER — Did . . . ever serve in U.S. Armed Forces? 22a.	Yes in 22a — When did he serve? *Enter code from below* 22b.	FOR ALL HOUSEHOLD MEMBERS 14 YEARS AND OVER — Is . . . now in the Armed Forces? *If YES, enter AF if NO, leave blank* 23.	What is the highest grade or year of regular school . . . has ever attended? *Enter code from below* 24a.	Did . . . complete that grade (year)? 24b.	What is . . .'s origin or descent? *(Show flash card)* *Enter code from below* 25.	What is . . .'s Social Security (or Railroad Retirement) Number? 26a.
13.																						
1			Y N									M F	Y N					Y N			
2			Y N									M F	Y N					Y N			
3			Y N									M F	Y N					Y N			
4			Y N									M F	Y N					Y N			
5			Y N									M F	Y N					Y N			
6			Y N									M F	Y N					Y N			
7			Y N									M F	Y N					Y N			

CHANGES IN HOUSEHOLD COMPOSITION *Continue in Notes if necessary*

Line No.	26b.
1	
2	
3	
4	
5	
6	
7	

ASK AS INDICATED
Ask first time household is interviewed in each 4-month period. *If "Yes," enter name in item 14a above.*

	Circle Y or N — 1st	5th
15a. I have listed (Read names in item 14a). Have I missed:		
– any babies or small children?	Y N	Y N
– any lodgers, boarders, or persons in your employ who live here?	Y N	Y N
– anyone who usually lives here but is away at present traveling, at school, or in a hospital?	Y N	Y N
– anyone else staying here?	Y N	Y N

Ask all other months

15b. I have listed (Read names in item 14a.) Is there anyone else living or staying here now? *(Circle Y or N)*

1	2	3	4	5	6	7	8
	Y N	Y N	Y N		Y N	Y N	Y N

RECORD OF VISITS AND TELEPHONE INTERVIEWS

	27a. Month in Sample	27b. Mo. Yr. (Example 1 72)	28a. Tally of personal visits	28b. Tally of regular Tel. calls	28c. Tally of telephone callbacks	28d. Nonintervew reason	28e Notes (on callbacks, etc.)	29. Superv. use R – Reint. D – Observed
1								
2								
3								
4								
5								
6								
7								
8								

CODES FOR 22b
Enter code in descending order of priority. Thus if person served in Vietnam and in Korea, enter VN.
- Vietnam Era . . . . . VN (Aug. '64 or later)
- Korean War . . . . . KW (June '50 – Jan.'55)
- World War II . . . . . WWII (Sept. '40 – July '47)
- World War I . . . . . WWI (Apr. '17 – Nov.'18)
- Other Service . . . . . DS (All other periods)

CODES FOR 24a
- Never attended . . . D
- Kindergarten . . . . K
- Elementary . . . E1-E8
- High School . . . H1-H4
- College (Academic) . . . C1-C5, C6+

Update item 24a in 5th month AND in February, July and October

CODES FOR 25

01 German	10 Mexican Amer
02 Italian	11 Chicano
03 Irish	12 Mexican
04 French	13 Mexicano
05 Polish	14 Puerto Rican
06 Russian	15 Cuban
07 English	16 Cen or So Amer
08 Scottish	17 Other Spanish
09 Welsh	20 Negro
	21 Black

30 Another Group not listed
39 Don't know

16. LIVING QUARTERS (indicate type, access and kitchen facilities)

16a. HOUSING UNIT
- ☐ House, apartment, flat
- ☐ HU in nontrans. hotel, motel, etc.
- ☐ HU-perm. in trans. hotel, motel, etc.
- ☐ HU in rooming house
- ☐ Mobile home or trailer
- ☐ HU not specified above *(Describe in footnotes)*

16b. ACCESS ☐ Direct ☐ Thru another unit

16c. COMPLETE KITCHEN FACILITIES
- ☐ For this unit only
- ☐ Also used by another household
- ☐ None

If "NONE," and unit vacant, did last occupants have complete kitchen facilities?
- ☐ For this unit only
- ☐ Also used by another household
- ☐ None

16d. OTHER UNIT
- ☐ Quarters not HU in rooming or boarding house
- ☐ Unit not permanent in transient hotel, motel, etc.
- ☐ Vacant tent site or trailer site
- ☐ Not specified above *(Describe in footnotes)*

FOOTNOTES

30. USE OF TELEPHONE

30a. What is your telephone number?

1st month	No.	
	No phone	☐
5th month	No phone	☐
	Same	☐
	No.	

30b. Is telephone interview acceptable?

1st month	5th month
Y N	Y N

31. What is the best time to call or visit?

33. TOTAL FAMILY INCOME IN PAST 12 MONTHS

What was the total income of this family during the past 12 months? This includes wages and salaries, net income from business or farm, pensions, dividends, interest, rent, Social Security payments, and any other money income received by the members of this family. *(Show flashcard) (Include related family members 14+yr.)*

A ☐ Under $1,000	F ☐ $ 5,000 to $ 5,999	J ☐ $12,000 to $14,999
B ☐ $1,000 to $1,999	G ☐ 6,000 to 7,499	K ☐ 15,000 to 19,999
C ☐ 2,000 to 2,999	H ☐ 7,500 to 9,999	L ☐ 20,000 to 24,999
D ☐ 3,000 to 3,999	I ☐ 10,000 to 11,999	M ☐ 25,000 to 49,999
E ☐ 4,000 to 4,999		N ☐ 50,000 and over

THE CENSUS FUNCTION

FOR UNITS IN HOUSING VACANCY SURVEY (HVS)

Transcribe from HVS schedule the first month unit is vacant. Transcribe to HVS in subsequent months unit is vacant during same 4-month period of enumeration. If unit is vacant in both the first and second 4-month periods of enumeration, repeat above procedure for second 4-month period of enumeration.

Name and telephone number of noninterview respondent (including HVS)

10. Interviewer Check Item

Is this housing unit on a ploce of –

	1st	2nd
Less than 10 acres	O	O
10 acres or more	O	O

11. In what year was this structure built?

- 1970 or later O
- 1965 to 1969 O
- 1960 to 1964 O
- 1950 to 1959 O
- 1940 to 1949 O
- 1930 to 1939 O
- 1929 or earlier O

12. How many units are in this structure?

(Count occupied and vacant)

	1st	2nd
1	O	O
2	O	O
3–4	O	O
5–9	O	O
10 or more	O	O

NUMBER OF ROOMS IN THIS UNIT

13. How many rooms are in this unit (count the kitchen but not the bathroom)?

	1st	2nd		1st	2nd
1	O	O	5	O	O
2	O	O	6	O	O
3	O	O	7	O	O
4	O	O	8 or more	O	O

14. How many bedrooms are in this unit?

	1st	2nd
None	O	O
1	O	O
2	O	O
3	O	O
4 or more	O	O

FOR VACANT SEASONAL HOUSING UNITS AND FOR VACANT SEASONAL HOUSING UNITS FOR MIGRATORY WORKERS

Transcribe from CPS-1 item 17 first month unit is vacant. Transcribe from Control Card to CPS schedule item 17 in subsequent months unit is vacant during some 4-month period of enumeration. If unit is seasonally vacant in both the first and second 4-month periods of enumeration, repeat above procedure for second 4-month period of enumeration.

PLUMBING FACILITIES FOR THIS UNIT

15. Is there hot and cold piped water inside structure for this unit?

	1st	2nd
Yes	O	O
No, only cold piped water	O	O
No piped water	O	O

16 Is there a flush toilet inside structure for this unit?

	1st	2nd
Yes, for this unit only	O	O
Yes but also used by a household in another unit	O	O
No flush toilet	O	O

17. Is there a bathtub or shower inside structure for this unit?

	1st	2nd
Yes, for this unit only	O	O
Yes, but also used by a household in another unit	O	O
No bath tub or shower	O	O

CPS-1 item 17.
Is this unit usually occupied?

	1st	2nd
Summers only	O	O
Winters only	O	O
Other *(Describe in footnotes)*	O	O

(Transcribe to back of Control Card first time unit is vacant during a 4-month enumeration period.)

TABLE X – LIVING QUARTERS DETERMINATIONS AT LISTED ADDRESS

Line No.	LOCATION OF UNIT — Where are these quarters located? *Enter exact description or location, e.g., basement; 2nd floor, rear* (2)	• If listed, enter sheet and line number and STOP • If unlisted, go to 4 (3)	• If outside Area Segment boundary; mark box below, STOP Table X, and go to C.C. item 8 or 9 (4)	Are these *(Specify location)* quarters for more than one group of people? *If Yes, fill one line for each group* (5)	USE OR CHARACTERISTICS — OCCUPIED: Do the occupants of these *(specify location)* quarters live and eat with any other group of people? (6)	ALL QUARTERS — Do these quarters in *(Specify location)* have: direct access from the outside or through a common hall? (7)	complete kitchen facilities for this unit only? (8)	CLASSIFICATION — N – Not a separate unit, add occupants to this Control Card: HU, OT – Separate unit–Interview on a separate Control Card (9)
(1)								
1		S ___ L ___	☐ Outside segment boundary	Yes No	Yes – Go to 9 and circle N No	Yes No	Yes No	N HU OT
2		S ___ L ___	☐ Outside segment boundary	Yes No	Yes – Go to 9 and circle N No	Yes No	Yes No	N HU OT
3		S ___ L ___	☐ Outside segment boundary	Yes No	Yes – Go to 9 and circle N No	Yes No	Yes No	N HU OT

NOTE: Be sure to continue interview with Control Card item 8 or 9 (as applicable)

FOOTNOTES

32a. CONTROL NO. OF ORIGINAL SAMPLE UNIT

32b. In area segment, enter for FIRST unit listed on property: Listing Sheet, Sheet ___ Line ___

FORM CPS-260 (6-10-74)

GPO 883-947

INTERVIEWER CHECK ITEM	FORM CPS-1	U.S. DEPARTMENT OF COMMERCE Bureau of the Census	CONTROL NUMBER		
Only CPS-1 for household ☐ First CPS-1 of continuation h'hold ☐ Second CPS-1 of continuation h'hold ☐ Third, fourth, and 5th CPS-1 ☐	*Form Approved*	*O.M.B. No. 41-R1202-14*	PSU	SEGMENT	SERIAL

LINE NO. OF H'HOLD RESP. _____

NON H'HOLD RESPONDENT ☐
(Specify and Send Intercomm)

INTERVIEW
ANY ENTRY IN CPS-1 ITEMS 23A-E ..... Yes ☐ / No ☐

NONINTERVIEW
TYPE A ☐
TYPE B ☐
TYPE C ☐

CURRENT

POPULATION

SURVEY

MARCH 1974

FIRST CHILD

25. LINE NO.

26. RELATIONSHIP TO HEAD OF HOUSEHOLD
(Control Card Item 14b)
(Enter relationship and mark one circle below)
Child.....
Other relative ...
Nonrelative -- own rels. in household ....
Nonrelative -- no own relatives in household..

OFFICE USE ONLY
Family No.
Fam. Rel.: Child..... / Other relative
Type: Sec. 1 / Sec. F / Sub. F

27. AGE *(Mark one circle only)*
0 1 2 3 4 5 6 7 8 9 10 11 12 13

29. RACE
White
Negro
Other

30. SEX
Male..
Female

FIFTH CHILD

25. LINE NO.

26. RELATIONSHIP TO HEAD OF HOUSEHOLD
(Control Card Item 14b)
(Enter relationship and mark one circle below)
Child.....
Other relative ...
Nonrelative -- own rels. in household ....
Nonrelative -- no own relatives in household..

OFFICE USE ONLY
Family No.
Fam. Rel.: Child..... / Other relative
Type: Sec. 1 / Sec. F / Sub. F

27. AGE *(Mark one circle only)*
0 1 2 3 4 5 6 7 8 9 10 11 12 13

29. RACE
White
Negro
Other

30. SEX
Male..
Female

SECOND CHILD

25. LINE NO.

26. RELATIONSHIP TO HEAD OF HOUSEHOLD
(Control Card Item 14b)
(Enter relationship and mark one circle below)
Child.....
Other relative ...
Nonrelative -- own rels. in household ....
Nonrelative -- no own relatives in household..

OFFICE USE ONLY
Family No.
Fam. Rel.: Child..... / Other relative
Type: Sec. 1 / Sec. F / Sub. F

27. AGE *(Mark one circle only)*
0 1 2 3 4 5 6 7 8 9 10 11 12 13

29. RACE
White
Negro
Other

30. SEX
Male..
Female

SIXTH CHILD

25. LINE NO.

26. RELATIONSHIP TO HEAD OF HOUSEHOLD
(Control Card Item 14b)
(Enter relationship and mark one circle below)
Child.....
Other relative ...
Nonrelative -- own rels. in household ....
Nonrelative -- no own relatives in household..

OFFICE USE ONLY
Family No.
Fam. Rel.: Child..... / Other relative
Type: Sec. 1 / Sec. F / Sub. F

27. AGE *(Mark one circle only)*
0 1 2 3 4 5 6 7 8 9 10 11 12 13

29. RACE
White
Negro
Other

30. SEX
Male..
Female

THIRD CHILD

25. LINE NO.

26. RELATIONSHIP TO HEAD OF HOUSEHOLD
(Control Card Item 14b)
(Enter relationship and mark one circle below)
Child.....
Other relative ...
Nonrelative -- own rels. in household ....
Nonrelative -- no own relatives in household..

OFFICE USE ONLY
Family No.
Fam. Rel.: Child..... / Other relative
Type: Sec. 1 / Sec. F / Sub. F

27. AGE *(Mark one circle only)*
0 1 2 3 4 5 6 7 8 9 10 11 12 13

29. RACE
White
Negro
Other

30. SEX
Male..
Female

SEVENTH CHILD

25. LINE NO.

26. RELATIONSHIP TO HEAD OF HOUSEHOLD
(Control Cord Item 14b)
(Enter relationship and mark one circle below)
Child.....
Other relative ...
Nonrelative -- own rels. in household ....
Nonrelative -- no own relatives in household..

OFFICE USE ONLY
Family No.
Fam. Rel.: Child..... / Other relative
Type: Sec. 1 / Sec. F / Sub. F

27. AGE *(Mark one circle only)*
0 1 2 3 4 5 6 7 8 9 10 11 12 13

29. RACE
White
Negro
Other

30. SEX
Male..
Female

FOURTH CHILD

25. LINE NO.

26. RELATIONSHIP TO HEAD OF HOUSEHOLD
(Control Card Item 14b)
(Enter relationship and mark one circle below)
Child.....
Other relative ...
Nonrelative -- own rels. in household ....
Nonrelative -- no own relatives in household..

OFFICE USE ONLY
Family No.
Fam. Rel.: Child..... / Other relative
Type: Sec. 1 / Sec. F / Sub. F

27. AGE *(Mark one circle only)*
0 1 2 3 4 5 6 7 8 9 10 11 12 13

29. RACE
White
Negro
Other

30. SEX
Male..
Female

EIGHTH CHILD

25. LINE NO.

26. RELATIONSHIP TO HEAD OF HOUSEHOLD
(Control Card Item 14b)
(Enter relationship and mark one circle below)
Child.....
Other relative ...
Nonrelative -- own rels. in household ....
Nonrelative -- no own relatives in household..

OFFICE USE ONLY
Family No.
Fam. Rel.: Child..... / Other relative
Type: Sec. 1 / Sec. F / Sub. F

27. AGE *(Mark one circle only)*
0 1 2 3 4 5 6 7 8 9 10 11 12 13

29. RACE
White
Negro
Other

30. SEX
Male..
Female

1. INTERVIEWER CHECK ITEM
Only CPS–1 for household ..... (Fill all applicable items on this page)
First CPS–1 of continuation h'hld.. (Transcribe Items 2-13 from first CPS–1)
Second CPS–1 of continuation h'hld.
Third, fourth, etc. CPS–1.....

FORM CPS–1
12 20 73
26.1 : 1

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

CURRENT POPULATION SURVEY

MARCH 1974

Form Approved
O.M.B. No. 41-R1202-14

2. SAMPLE A C

3. CONTROL NUMBER

MONTH

YEAR

4. TYPE OF LIVING QUARTERS

HOUSING UNIT	OTHER UNIT
House, apartment, flat	Quarters not HU in rooming or boarding house
HU in nontransient hotel, motel, etc.	Unit not permanent in transient hotel, motel, etc.
HU, permanent, in transient hotel, motel, etc.	Tent site or trailer site
HU in rooming house	Other not HU (Describe below)
Mobile home or trailer	
HU not specified above (Describe below)	

5. LAND USAGE (Transcribe from Control Card items 10a, 11 or 12)
A
B
C
D
E

6. PSU NO.

7. SEGMENT NO.

8. SERIAL NO.

9. HOUSEHOLD NO.

10. INTERVIEWER CODE
A B C D E F G H J K L M

11. DATE COMPLETED

12. LINE NO. H'HLD. RESP.
Non. h'hld.resp. (Specify) (Send Inter Comm)

13. TYPE INTERVIEW
Noninterview
Personal....
Tel.-regular
Tel.-callback
ICR filled...

NONINTERVIEW

TYPE A

14. (Mark reason and race.)

REASON	RACE OF HEAD
No one home	White
Temporarily absent	Negro
Refused...	Other
Other-Occ. (Describe below)	

TYPE B

15.
Vacant - regular ..... (Fill 16)
Vacant - storage of h'hld furniture
Temp. occ. by persons with URE .
Unfit or to be demolished..... (Omit 16-17)
Under construction, not ready ....
Converted to temp. business or storage ..
Occ. by Armed Force members or persons under 14..
Unoccupied tent site or trailer site
Permit granted, construction not started .....
Other (Specify below).....

TYPE C

Demolished ..... (Omit 16-17)
House or trailer moved .
Outside segment.....
Converted to permanent business or storage.
Merged .....
Condemned.....
Built after April 1, 1970
Other (Describe below) ..

SEASONAL STATUS

16.
Year round ..... (Fill HVS if HU in Item 4)
Migratory workers. (Fill Item 17 below if HU in Item 4)
Seasonal .....

17. Is this unit usually occupied:
Summers only .... (Transcribe as instructed on back of Control Card.)
Winters only .....
Other .....
(Describe below)

54. INTERVIEWER CHECK ITEM
a. Is any person classified as one of the 7 Spanish origins in Item 52?
(Mexican-American, Chicano, Mexican (Mexicano), Puerto Rican, Cuban, Central or So. Amer. or Other Spanish)
Yes (Ask b) No (Go to page 2)

b. Did the head of this household . . . . live at this address during the week of November 19, 1973?
Yes No

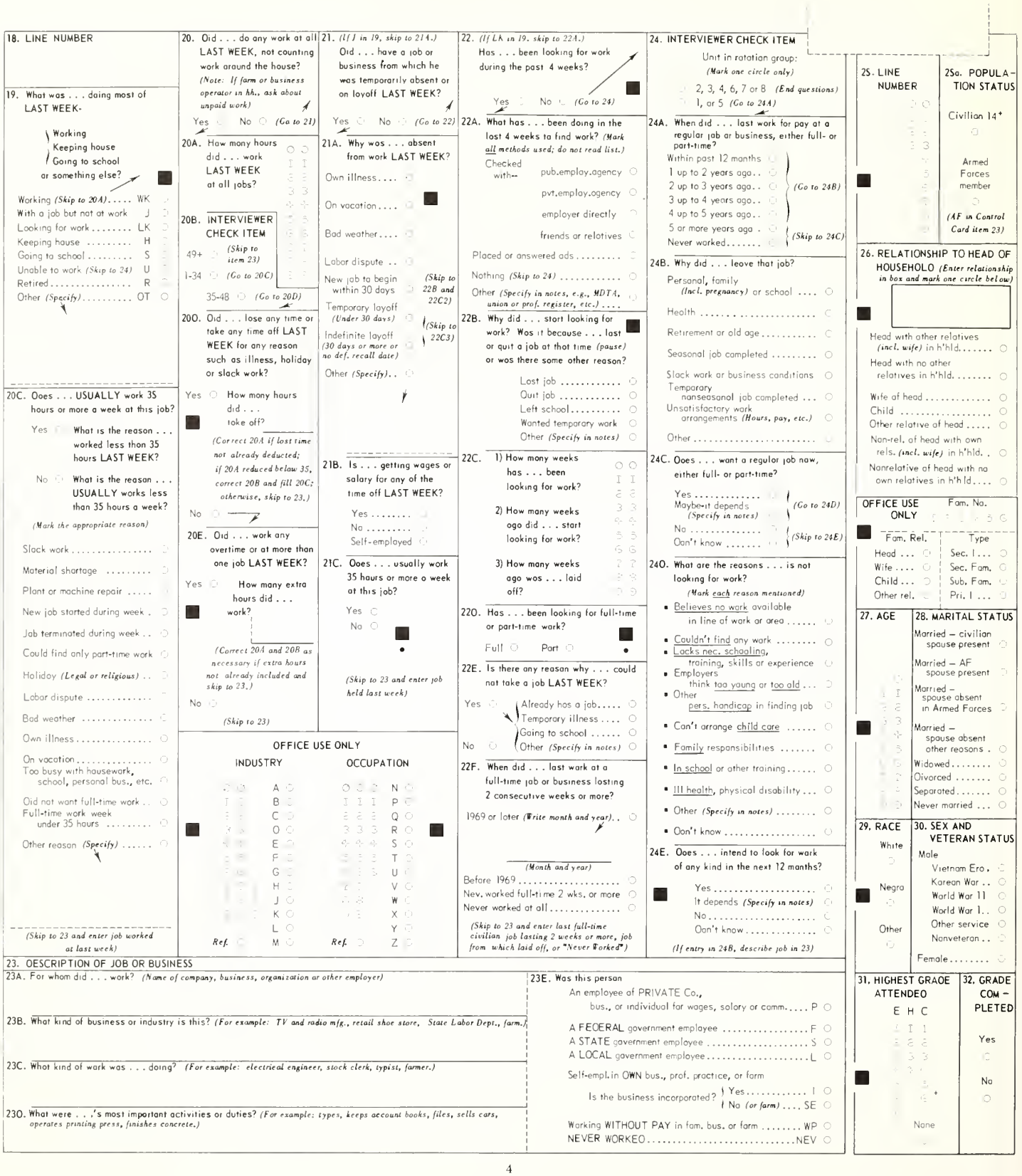
(Go to page 2)

55. CPS-581 required for one or more persons on this document .....
List line numbers and item numbers below:

Line Number(s)	Item Number(s)

NOTES:

CODER NUMBER
A B C D E F G H J K L M


18. LINE NUMBER
19. What was . . . doing most of LAST WEEK-
Working
Keeping house
Going to school
or something else?
Working (Skip to 20A) . . . . . WK
With a job but not at work . . . . . J
Looking for work . . . . . LK
Keeping house . . . . . H
Going to school . . . . . S
Unable to work (Skip to 24) . . . . . U
Retired . . . . . R
Other (Specify) . . . . . OT
20. Did . . . do any work at all LAST WEEK, not counting work around the house? (Note: If farm or business operator in hh., ask about unpaid work)
Yes
No (Go to 21)
20A. How many hours did . . . work LAST WEEK at all jobs?
20B. INTERVIEWER CHECK ITEM
49+ (Skip to item 23)
1-34 (Go to 20C)
35-48 (Go to 20D)
20O. Did . . . lose any time or take any time off LAST WEEK for any reason such as illness, holiday or slack work?
Yes
How many hours did . . . take off?
(Correct 20A if lost time not already deducted; if 20A reduced below 35, correct 20B and fill 20C; otherwise, skip to 23.)
No
20E. Did . . . work any overtime or at more than one job LAST WEEK?
Yes
How many extra hours did . . . work?
(Correct 20A and 20B as necessary if extra hours not already included and skip to 23.)
No
(Skip to 23)
20C. Does . . . USUALLY work 35 hours or more a week at this job?
Yes
What is the reason . . . worked less than 35 hours LAST WEEK?
No
What is the reason . . . USUALLY works less than 35 hours a week?
(Mark the appropriate reason)
Slack work 1
Material shortage 2
Plant or machine repair 3
New job started during week 4
Job terminated during week 5
Could find only part-time work 6
Holiday (Legal or religious) 7
Labor dispute 8
Bad weather 9
Own illness 10
On vacation 11
Too busy with housework, school, personal bus., etc. 12
Did not want full-time work 13
Full-time work week under 35 hours 14
Other reason (Specify) 15
(Skip to 23 and enter job worked at last week)
21. (If J in 19, skip to 21A.) Did . . . have a job or business from which he was temporarily absent or on layoff LAST WEEK?
Yes
No (Go to 22)
21A. Why was . . . absent from work LAST WEEK?
Own illness 1
On vacation 2
Bad weather 3
Labor dispute 4
New job to begin within 30 days . . . . 5 (Skip to 22B and 22C2)
Temporary layoff (Under 30 days) 6
Indefinite layoff (30 days or more or no def. recall date) . . . . 7 (Skip to 22C3)
Other (Specify) 8
21B. Is . . . getting wages or salary for any of the time off LAST WEEK?
Yes 1
No 2
Self-employed 3
21C. Does . . . usually work 35 hours or more a week at this job?
Yes
No
(Skip to 23 and enter job held last week)
OFFICE USE ONLY
INDUSTRY
OCCUPATION
A B C O E F G H J K L M Ref.
N P Q R S T U V W X Y Z Ref.
22. (If LK in 19, skip to 22A.) Has . . . been looking for work during the past 4 weeks?
Yes
No (Go to 24)
22A. What has . . . been doing in the last 4 weeks to find work? (Mark all methods used; do not read list.)
Checked with--
pub.employ.agency
pvt.employ.agency
employer directly
friends or relatives
Placed or answered ads 5
Nothing (Skip to 24) 6
Other (Specify in notes, e.g., MDTA, union or prof. register, etc.) 7
22B. Why did . . . start looking for work? Was it because . . . last or quit a job at that time (pause) or was there some other reason?
Lost job 1
Quit job 2
Left school 3
Wanted temporary work 4
Other (Specify in notes) 5
22C. 1) How many weeks has . . . been looking for work?
2) How many weeks ago did . . . start looking for work?
3) How many weeks ago was . . . laid off?
22O. Has . . . been looking for full-time or part-time work?
Full
Part
22E. Is there any reason why . . . could not take a job LAST WEEK?
Yes
Already has a job 1
Temporary illness 2
Going to school 3
Other (Specify in notes) 4
No
22F. When did . . . last work at a full-time job or business lasting 2 consecutive weeks or more?
1969 or later (Write month and year) 1
(Month and year)
Before 1969 2
Nev. worked full-time 2 wks. or more 3
Never worked at all 4
(Skip to 23 and enter last full-time civilian job lasting 2 weeks or more, job from which laid off, or "Never Worked")
24. INTERVIEWER CHECK ITEM
Unit in rotation group:
(Mark one circle only)
2, 3, 4, 6, 7 or 8 (End questions)
1, or 5 (Go to 24A)
24A. When did . . . last work for pay at a regular job or business, either full- or part-time?
Within past 12 months
1 up to 2 years ago . .
2 up to 3 years ago . .
3 up to 4 years ago . .
4 up to 5 years ago . .
5 or more years ago . .
Never worked 7
(Go to 24B)
(Skip to 24C)
24B. Why did . . . leave that job?
Personal, family (Incl. pregnancy) or school 1
Health 2
Retirement or old age 3
Seasonal job completed 4
Slack work or business conditions 5
Temporary nonseasonal job completed . . . 6
Unsatisfactory work arrangements (Hours, pay, etc.) 7
Other 8
24C. Does . . . want a regular job now, either full- or part-time?
Yes 1
Maybe-it depends (Specify in notes) 2
(Go to 24D)
No 3
Don't know 4
(Skip to 24E)
24O. What are the reasons . . . is not looking for work?
(Mark each reason mentioned)
Believes no work available in line of work or area 1
Couldn't find any work 2
Lacks nec. schooling, training, skills or experience 3
Employers think too young or too old 4
Other pers. handicap in finding job 5
Can't arrange child care 6
Family responsibilities 7
In school or other training 8
Ill health, physical disability 9
Other (Specify in notes) 10
Don't know 11
24E. Does . . . intend to look for work of any kind in the next 12 months?
Yes 1
It depends (Specify in notes) 2
No 3
Don't know 4
(If entry in 24B, describe job in 23)
25. LINE NUMBER
25a. POPULATION STATUS
Civilian 14+
Armed Forces member
(AF in Control Card item 23)
26. RELATIONSHIP TO HEAD OF HOUSEHOLD (Enter relationship in box and mark one circle below)
Head with other relatives (incl. wife) in h'hld. 1
Head with no other relatives in h'hld. 2
Wife of head 3
Child 4
Other relative of head 5
Non-rel. of head with own rels. (incl. wife) in h'hld. . 6
Nonrelative of head with no own relatives in h'hld. . . . 7
OFFICE USE ONLY
Fam. No.
Fam. Rel.
Head . . . 1
Wife 2
Child . . . 3
Other rel. 4
Type
Sec. I . . . 1
Sec. Fam. 2
Sub. Fam. 3
Pri. I . . . 4
27. AGE
28. MARITAL STATUS
Married – civilian spouse present 1
Married – AF spouse present 2
Married – spouse absent in Armed Forces 3
Married – spouse absent other reasons 4
Widowed 5
Divorced 6
Separated 7
Never married 8
29. RACE
White 1
Negro 2
Other 3
30. SEX AND VETERAN STATUS
Male
Vietnam Era . 1
Korean War . . 2
World War II . 3
World War I . . 4
Other service 5
Nonveteran . . 6
Female 7
31. HIGHEST GRADE ATTENDED
E H C
None 0
32. GRADE COMPLETED
Yes 1
No 2
23. DESCRIPTION OF JOB OR BUSINESS
23A. For whom did . . . work? (Name of employer, business, organization or other employer)
23B. What kind of business or industry is this? (For example: TV and radio mfg., retail shoe store, State Labor Dept., farm.)
23C. What kind of work was . . . doing? (For example: electrical engineer, stock clerk, typist, farmer.)
23O. What were . . .'s most important activities or duties? (For example: types, keeps account books, files, sells cars, operates printing press, finishes concrete.)
23E. Was this person
An employee of PRIVATE Co., bus., or individual for wages, salary or comm. . . . . P
A FEDERAL government employee . . . . . F
A STATE government employee . . . . . S
A LOCAL government employee L
Self-empl. in OWN bus., prof. practice, or farm
Is the business incorporated? Yes I
No (or farm) . . . . SE
Working WITHOUT PAY in fam. bus. or farm . . . . . WP
NEVER WORKED . . . . . NEV

33. INTERVIEWER CHECK ITEM

Civilian 14+ (Ask 34)

Armed Forces member (Skip to 45)

34. In 1973 how many weeks did ... work either full time or part time not counting work around the house? *(Include paid vacation and paid sick leave)*

(Mark weeks)

If 1-49 *(Skip to 38)*

If 50-52 *(Skip to 40)*

None

(Ask 35)

35. Even though ... did not work in 1973, did he spend any time trying to find a job?

Yes *(Ask items 36-37)* No *(Skip to item 37)*

36. How many different weeks was ... looking for work or on layoff from a job?

1-4 wks.. 27-39 wks.

5-14 wks. 40 wks. or more

15-26 wks.

(Ask item 37)

37. What was the main reason ... did not work in 1973? Was he ...

Ill or disabled and unable to work

Taking care of home or family ...

Going to school .....

Could not find work .....

In Armed Forces

Retired .....

Other ..... *(Specify)*

(Skip to item 45)

38. You said ... worked about *(entry in item 34)* weeks in 1973. How many of the remaining *(52 minus entry in item 34)* weeks was ... looking for work or on layoff from a job?

(Mark weeks and ask 39)

None

(Skip to 41)

39. Were the _____ weeks ... was looking for work (or on layoff) all in one stretch?

Yes -- 1 stretch .. *(Skip to item 41)*

No -- 2 stretches.

No -- 3+ stretches

40. Did ... lose any full weeks of work in 1973 because he was on layoff from a job or lost a job?

Yes / No *(Skip to 43)*

41. INTERVIEWER CHECK ITEM
Are all weeks accounted for in items 34 and 38?

Yes *(Skip to 43)* No *(Ask 42)*

42. What was ... doing most of the remaining weeks in 1973?

Was he ...

Ill or disabled and unable to work .....

Taking care of home or family

Going to school .....

In Armed Forces .....

Retired .....

Other *(Specify)* .....

(Ask item 43)

43. When ... was working in 1973, did he usually work full time or part time?

Full time Part time

44. What was ...'s longest job in 1973? *(Compare with entry in item 23)*

Same as item 23 ..... *(Skip to item 45)*

Different from item 23 *(or item 23 blank)* *(Specify below and go to item 45)*

44A. NAME OF EMPLOYER

44B. INDUSTRY

44C. OCCUPATION

44D. MAJOR ACTIVITIES

44E. CLASS OF WORKER

Private ..... P

Federal Gov't. .... F

State Gov't. ..... S

Local Gov't. L

Self-emp. Inc. { Yes ..... I / No *(or farm)* . SE

Without pay ..... WP

(Ask item 45)

FOR OFFICE USE ONLY

INDUSTRY

Ø 1 2 3 4 5 6 7 8 9 A B C D E F G H J K L M

OCCUPATION

Ø 1 2 3 4 5 6 7 8 9 N P Q R S T U V W X Y Z

49. Did ... live in this house four years ago; that is on March 1, 1970?

Yes *(Skip to 52)*

No *(Ask 50)*

MIGRATION

50. Where did ... live on March 1, 1970?

a. Name of State, foreign country, U.S. possession, etc.

b. Name of county

51. Did ... live inside the limits of a city, town, village, etc.?

Yes *(Enter name of town, etc.)* No *(Go to 52)*

INCOME IN THE YEAR 1973 *(Write actual amount in the space provided in items 45-48e and mark the appropriate dotted numbers.)*

LAST YEAR (1973) How much did ... receive

45. In wages or salary before any deductions?

CPS-581

None

$

46. In net income from his own business or professional practice or partnership?

CPS-581 MARK NET INCOME

None

Gross income $

minus

Business expense $ Lost Money

equals

Net income $

47. In net income from his own farm?

CPS-581 MARK NET INCOME

None

Gross income $

minus

Business expense $ Lost money

equals

Net income $

48. During 1973, did ... receive any money from:

48a. • Social Security checks from the U.S. Government?

Yes No

• Railroad Retirement checks from the U.S. Government?

Yes No

How much altogether? $

CPS-581

48b. • Estates, trusts, or dividends?

Yes No

• Interest on savings accounts or bonds?

Yes No

• Net rental income?

Yes No

How much altogether? $

CPS-581

Lost money

48c. • Welfare payments or other public assistance *(aid to families with dependent children, old age assistance, or aid to the blind or totally disabled)*?

Yes No

(Determine specific AMOUNTS and months RECEIVED)

How much altogether? $

CPS-581

48d. • Unemployment compensation?

Yes No

• Workmen's compensation?

Yes No

• Government employee pensions?

Yes No

• Veteran's payments?

Yes No

How much altogether? $

CPS-581

48e. • Private pensions or annuities?

Yes No

• Alimony?

Yes No

• Regular contributions from persons not living in this household?

Yes No

• Anything else?

Yes No

How much altogether? $

CPS-581

52. What is ...'s origin or descent? *(Show Flash Card or read list)*

01 German .. 10 Mexican-American .

02 Italian .. 11 Chicano.....

03 Irish.... 12-13 Mexican *(Mexicano)*

04 French .. 14 Puerto Rican .....

05 Polish .. 15 Cuban.....

06 Russian . 16 Central or So. Amer.

07 English, 08 Scottish, 09 Welsh.. 17 Other Spanish .....

20-21 Negro or Black ...

30 Other *(Specify below)*

Don't know

53a. Interviewer Check Item

Who reported on income for this person?

Self Other

b. Type of Interview for this person *(One entry only)*

Personal only Telephone, regular

Personal, telephone callback Telephone, regular telephone, callback

IF LAST PERSON, GO TO ITEM 54

PLANNING THE FEDERAL STATISTICAL SYSTEM—A HISTORICAL PERSPECTIVE

Joseph Duncan, Deputy Associate Director for Statistical Policy, Office of Management and Budget

"As individual economic and social problems have become evident or new social or economic programs defined, the Congress has authorized specific statistical activities to meet the needs of policymaking, program administration, and general analysis of social well-being. For most of this century there has been a growing effort to initiate effective planning and coordination of the many demands for statistical information associated with both congressional concerns and executive requirements."

Joseph Duncan

Mr. Barabba: Our next speaker is Dr. Joseph Duncan. He is the Deputy Associate Director of the Office of Management and Budget responsible for statistical policy, and in that capacity he is considered to be the chief statistician of our Federal statistical system. This office, since Dr. Duncan came, has been asserting itself as the coordinating center for the entire Federal statistical system, although there's no central statistical office in the United States as exists in many countries. There are advantages and disadvantages of decentralization which Dr. Duncan will discuss, as well as how his office and the rest of the statistical agencies operate and make decisions.

Dr. Duncan: Throughout this series you have discussed a variety of important statistical programs each of which makes significant contributions to our Nation's total knowledge concerning economic and social issues. Today I plan to review the development of the Federal statistical system and outline current programs which assure its continued development.

In undertaking this rather wide ranging assignment I, first, would like to identify the principal conditions that created the statistical system. Next, I plan to trace the historical development of the Statistical Policy Division in the Office of Management and Budget, which is responsible for planning and coordinating this system. Finally, I will outline the nature of the planning process presently being defined to respond to future needs.

Factors Affecting System Development

If a statistical management expert were required to create a Federal statistical system for the United States in 1974, assuming no past statistical activity, it is doubtful that he would design the sprawling monster that we cope with now. It has been estimated that as many as 65 to 88 Federal agencies are authorized to collect, compile, and disseminate statistical data.[1] Regardless of the definition of "agency" and "statistics," it is clear there are large numbers of separate and distinct organizations producing statistics within the Federal Government.

How did this data collection begin? People sometimes erroneously believe that government agencies established for other purposes have launched statistical programs in an effort to perpetuate or expand themselves. This is not so. Before I give you some historical perspective on how the United States came to have so many statistical cells within the agencies, let me give you a modern example with which we are all familiar.

In the Federal Energy Administration Act of 1974, Section 13, entitled "Information-Gathering Power," gives the Administration broad powers to collect, assemble, evaluate, and analyze energy information. This section also requires that all persons involved in any phase of energy production or consumption make records available to the administrator and respond to specific questions asked by the administrator, who is empowered to investigate and verify information and to subpoena records of a statistical nature. This act is a prototype, in many respects, of legislation requiring and empowering a Federal agency, newly created in response to a critical national situation, to establish a statistical program.

The first legislation calling for Federal statistical activity, the Constitution of the United States, required an enumeration of the population within 3 years after the first meeting of the Congress and every 10 years thereafter. This was the origin of the Census Bureau, with Thomas Jefferson as the first Director of the Census. Alexander Hamilton, Secretary of the Treasury, issued America's first statistical publication, reporting the population and foreign commerce in 1790. Originally, the Census Bureau was phased out after its decennial activity, but subsequent legislation and responsibilities gradually closed the gap between censuses.

For example, the Director of the Census was "authorized and directed to collect and publish, for every second year after 1927, statistics of manufacturing industries."[2] In 1929, it was decreed that "a census of population, irrigation, drainage, distribution, unemployment, and mines shall be taken by the Director of the Census in the year 1930 and every 10 years thereafter."[3] In fact, one requirement was remarkably detailed:

> The Director of the Census is authorized and directed to collect and publish statistics concerning the number of squares of red-cedar shingles produced in shingle manufacturing establishments in the United States; the quantity of Canadian produced red-cedar shingles stored in U.S. warehouses and subsequently withdrawn therefrom; and the current imports of red-cedar shingles from Canada....The statistics as to the number of squares of shingles...shall relate to each calendar month and shall be published as soon as possible after the close of the month.[4]

[1] Stuart A. Rice, "American Government and Politics," **The American Political Science Review**, Vol. XXXIV, No. 3, June 1940.

[2] Act of June 18, 1929, C. 28, sec. 17, 46 Stat. 25.

[3] Act of June 18, 1929, C. 28, sec. 1, 46 Stat. 21.

[4] Act of May 25, 1937, C. 261, sec. 1, 50 Stat. 204.

Statutory requirements for agriculture statistics were first established in 1862.[5] In 1927, the Secretary of Agriculture was directed to collect annual statistics and to publish his estimates of grades and staple length of cotton of the then current crop.[6] In 1929, detailed statistics about tobacco were also authorized.[7]

In 1888, the Bureau of Labor Statistics received its legislative mandate as follows:

> ...to acquire and to diffuse among the people of the United States useful information on subjects connected with labor ...and especially upon its relation to capital, the hours of labor, the earnings of laboring men and women, and the means of promoting their materials, social, and intellectual, and moral prosperity.[8]

Federal statistical programs often originate in congressional legislation. In fact, the economic and social history of this country could probably be traced around the statistical programs that have emerged sequentially through legislation, particularly when statistical activities associated with program administration are also taken into account. A notable example is the collection of statistics related to the various Social Security programs.

This process of generating a statistical system has given this Nation the best statistical coverage in the world. But the efficiency of this uncentralized system has been challenged periodically during the last several decades. Other countries such as England and Canada meet their statistical needs most adequately with centralized systems, and the concept has great appeal. Inherent in a centralized system are the promises of coordination, elimination of duplication, and economies of staff and equipment. The subject has been carefully studied a number of times by experts, but the impracticalities of centralizing Federal statistical activities always overruled its conceptual neatness. Complexities of legislation and program combine with vast geographic spread and a large population to make it more feasible to do the best we can with the system we have.

Another recurrent outcome of these studies of the Federal statistical system is the recommendation for increased coordination. As background for our subsequent discussion, I should like to trace the development of coordinating efforts leading up to the establishment of the Statistical Policy Division in the Office of Management and Budget.

Historical Trends in the Coordination of Statistics

As early as 1908, an interdepartmental statistical committee was established by Executive order to report on coordination among statistical activities which were expanding to keep pace with the growth of the Nation.

Wars give rise to the need for the production of statistics. During World War I, the proliferation of statistical activities associated with the war effort caused enough concern that in 1918 the War Industries Board established the Central Bureau of Planning and Statistics. Some of the functions the Bureau undertook were to improve statistical operations by developing uniform standards and definitions, cataloging government statistics, and advising the agencies on statistical methods. Although this Bureau existed only until 1919 when its functions were transferred to the Bureau of Efficiency, some of the tasks it set for itself read much like the present-day objectives of the Statistical Policy Division of OMB.

The Bureau of Efficiency concerned itself with statistical coordination from 1919 to 1922, and vainly recommended to Congress centralization of nonadministrative statistical work in a Federal Bureau of Statistics. This may have been the earliest of several attempts to establish major centralization, efforts which have consistently failed.

A Federal Statistics Board, established in 1931, was ineffective largely because of lack of authority and staff. By direction of President Hoover in a Budget circular, the board was to study the collection, compilation, and use of statistics and to recommend economies and means for fuller utilization of statistics and statistical personnel.

The successor agency, the Central Statistical Board, was the earliest viable ancestor of today's Statistical Policy Division. Its foundations, therefore, are of great interest as the precursor of current coordination practices at the national level. The Board was an independent agency in 1933 when the important statistical issues of the times concerned the Government's efforts to cope with the depression. The Board was initially limited to reviewing and coordinating statistical activities for the National Industrial Recovery Act.

In 1934, an Executive order, in addition to broadening the scope of concern relative to the recovery program, directed the Board to plan and promote the improvement, development, and coordination of statistical services. It had authorization to investigate any statistical service of a Federal agency, and certain non-Federal statistical services.

The Chairman of the Board was Dr. Stuart A. Rice. When the Board's functions were transferred to the Bureau of the Budget, Dr. Rice was selected the Assistant Director of BOB for Statistical Standards until his retirement at the end of 1954. Many illustrious names of the 1930's were associated with the Central Statistical Board and the Central Statistical Committee, which served in an advisory and supervisory capacity. Frances Perkins, then Secretary of Labor, was the Committee's Chairman with Henry Morgenthau, Secretary of the Treasury; Henry Wallace, Secretary of Agriculture; and Daniel C. Roper, Secretary of Commerce, as Committee members. The Board, itself, had leading government administrators of the era as members, including Arthur Altmeyer, who led the Social Security Board through its early days, Morris Copeland, who was the Executive Secretary, and Federick Stephen, a leading international figure in statistics.

I cite these names to demonstrate the great importance that was increasingly attributed to good statistics during the Depression era, when urgent national policy was formulated on the basis of fragmentary, inconsistent, and out-of-date numbers, only awkwardly reflecting the economic state of the country. In contrast to the present system with its monthly and weekly economic indicators, the Board in 1938 reported as follows: "The Board has been urging for the past 3 years the quarterly collection...of a brief financial statement from a limited number of corporations...to fill important gaps in business trends."[9] It was modestly hoped that this procedure could be tried on an "experimental basis, in the not too distant future."

[5] Act of May 5, 1862, C. 72, sec. 3, 12 Stat. 387.
[6] Act of Mar. 3, 1927, C. 337, sec. 1, 44 Stat. 1372.
[7] Act of Jan. 14, 1929, C. 69, sec. 1, 45 Stat. 1079.
[8] Act of June 13, 1888, C. 389, sec. 1, 25 Stat. 182.

[9] Fourth Annual Report of the Central Statistical Board, June 30, 1938.

The Board concerned itself in the late 1930's with issues such as the development of the Standard Industrial Classification. The Board also reported "a strong and friendly interest in the statistical activities of State governments." And in 1938, the President asked the Board "to make recommendations designed to lighten the burden (on business and the public) of reports."

As always, Congress was increasing reporting requirements while the executive branch of government was trying to hold them down. For example, in May 1938, Congress passed an act broadening the scope of statistics required of processors of peanuts and peanut oil. However, since some of the required data were already being collected by the Census Bureau, the Board was successful in eliminating the duplication in the statistics of peanuts.

By 1938, it was estimated by the Board that 88 Federal agencies collected reports from the public. At that time, about three-quarters of Federal statistical work was "administrative" and connected with governmental services and regulatory activities, like Social Security, relief, transportation, and income tax statistics, much of which had useful general byproducts.

In 1940, Stuart Rice reported the following:

> The Federal statistical system has many of the characteristics of the national statistical system of which it is a part and of the social economy which it supplements. It is made up of a large number of semicompetitive, semimonopolistic, semi-integrated agencies, without very effective central control. This is true also of the administrative agencies to which the statistical agencies are subjoined.[10]

However, in spite of this proliferation of statistical responsibility, the Board recommended official acknowledgement that various Federal statistical services be attached to those agencies with responsibilities relating to the subjects of the reports. Also, because of the decentralization, a statistical coordinating agency with adequate powers was essential, Rice concluded.

Historically, statistics originated with the agency programs and services. General-purpose statistics necessary for broad informational and policymaking reasons were concentrated then, as they are now, in relatively few agencies.

The Central Statistical Board was transferred to the Bureau of the Budget by the Reorganization Act of 1939 which also transferred BOB from the Treasury Department to the Executive Office of the President. The Board's functions remained essentially unchanged until the Federal Reports Act of 1942[11] greatly enlarged the division's scope of work. That and the later amended Budget and Accounting Act of 1921,[12] were the statutory bases for Federal statistical coordination. Prior to that time it was recognized that coordination was needed, but no real statutory basis for that coordination existed. This legislation recommended minimizing respondent burden, investigating data-gathering methods, and coordinating the "information-collecting" services of government. The laws are specific as to agencies excluded, release of information, and necessary actions.

Student: Is your only function the elimination of duplication? What happens when forms come across your desk and you think it's absolute idiocy to approve them even if duplication is minimal?

Dr. Duncan: We have several criteria in addition to duplication. For example, we look at survey methodology, and we also have some informal guidelines with regard to individual privacy; e.g. "are these reasonable questions to be asked?" Our main approach right now, however, is to determine the basis of the suggested data collection. If there is insufficient reason for seeking the information we will disapprove it even if no one else is collecting it.

The 1950 Budget and Accounting Act, Section 103, instructs the Director of the Bureau of the Budget to develop and administer programs for the improved gathering, compiling, analyzing, publishing, and disseminating of statistical information for any purpose by the various agencies in the executive branch of the Government. This responsibility and authority were delegated to the Assistant Director for Statistical Standards, now entitled Deputy Associate Director for Statistical Policy.

During World War II, the responsibilities of the office were compounded by the necessity of approving questionnaires associated with the war effort. New agencies like the Office of Price Administration and the War Production Board were brought under the control of the Budget Bureau to keep necessary reporting by business and industry to a reasonable minimum. In 1943, the first year after the enactment of the reporting law, about 7,500 questionnaires were submitted of which about 12 percent were disapproved.

After the war, the Division's forms clearance responsibilities diminished to about 2,500 to 3,000 requests in the mid-1950's—a level which has remained fairly constant—and coordination and integration efforts were increased. The Division of Statistical Standards, changed to the Office of Statistical Standards in 1952, encouraged the agencies to establish internal clearance units to sift out unacceptable reporting proposals. Also, the office was receiving assistance from numerous interdepartmental committees.[13] In the fall of 1951, the American Statistical Association organized an Advisory Committee on Statistical Policy whose membership was then composed of past presidents of the Association. It is interesting to note that a leading topic of the first meeting of the ASA Advisory Committee, confidentiality, is still a major agenda item for that committee.

In the early 1950's, considerable emphasis was also given to the development of documents defining statistical standards, like Standards for the Publication of Statistical Data, Standard Commodity Classification, and Standard Industrial Classification. These standards promoted comparability and helped to control the quality of statistical collection and tabulation.

Additional Roles for the Office of Statistical Standards

During the 1950's, the role of the Office of Statistical Standards expanded. In addition to its functions concerned with reviewing agency data-collection proposals and setting standards, the office also reviewed the adequacy of statistical series and planned for new series to fill statistical gaps. The office participated in international activities preparing position papers on statistical matters, selecting U.S. data for United Nations publications, and representing the U.S. on statistical advisory bodies to international organizations.

In 1955, Dr. Raymond T. Bowman became the Assistant Director for Statistical Standards of the Bureau of the Budget,

[10] Stuart Rice, op. cit.
[11] Public Law 831, December 24, 1942.
[12] Public Law 13, June 10, 1921; Public Law 784, September 12, 1950.
[13] "The Development of Statistical Coordination," by Clem C. Linnenberg, Jr., **The American Statistician**, June-July 1949.

replacing Dr. Rice. In addition to directing the work of the Office of Statistical Standards, he wrote extensively on statistical developments. In an address before the Washington Statistical Society, in January 1957, Bowman noted that although the statistical program of the U.S. was outstanding, it was not good enough for the demands made upon it—a statement likely to be forever applicable. Recognizing the impact of computers on the capability for producing fast, detailed information, he urged special attention to the quality of statistics, particularly referring to the work being done by the Census Bureau and the Bureau of Labor Statistics in the field of response error. Sampling had been introduced in national surveys at the end of the 1930's, and techniques had steadily improved during the 1940's and 1950's while nonsampling error still required great research and experimental efforts.

Quality was emphasized by the Office of Statistical Standards (OSS), as were detailed improvements in economic statistics. The Budget Bureau in 1956 contracted with the National Bureau of Economic Research for an independent appraisal of the national income and product accounts. It encouraged the greater development of a joint Security Exchange Commission and Federal Trade Commission (SEC-FTC) quarterly report for manufacturing, trade and mining corporations.

The Office of Statistical Standards arranged for the Federal Reserve System to take leadership in developing and interpreting personal savings data. Also, greater use of administrative records, such as IRS records and BOASI (Bureau of Old-Age and Survivors Insurance) records, was encouraged as a relatively inexpensive source of statistical information. OSS efforts at integration and coordination were fully focused on improving economic series such as employment, unemployment, and construction statistics, and manufacturers' sales, inventories and new orders. In the 1950's, as before, social statistics were not greatly emphasized in the Office of Statistical Standards.

For the next few years, through the mid-1960's, the Federal statistical system grew in complexity. The agencies were having problems of internal coordination as their statistical programs grew in response to increased demand for data. The Census Bureau was increasing its data-collection and processing services for other agencies on a reimbursable basis, and outside contracting grew as a resource for agencies incapable of their own.

Although in 1964 the OSS staff was reduced to less than 40 persons, the activities of the office expanded in several directions. Since the central coordinating agency, the Office of Statistical Standards, was formally entrenched in a good legislative base with three decades of experience behind it, the efforts of the office often took on a shape determined by the specific backgrounds, abilities and leadership qualities of the personnel. The Federal statistical agencies also tended toward shaping their programs on the basis of a focal agency concept. That is, although several agencies might be engaged in one way or another in a specific statistical activity, one agency was generally recognized as the lead agency, exercising its coordinating efforts with the support of the Office of Statistical Standards. Hence, this aspect of coordination was viewed as based on an interacting principle.

OSS continued to regard several other devices as coordinating instruments, such as the review of agency statistical budgets, data requests, interagency committees and task forces, nongovernmental advisory groups, the use of technical consultants, promulgation of standards, and the issuance of a number of publications relative to the operations of the Federal statistical system.

Toward the end of the 1950's when inflationary pressures following World War II were building up to serious proportions, greater emphasis was applied to work in price statistics, especially in connection with the CPI (Consumer Price Index) and the WPI (Wholesale Price Index). Another reflection of the economic stress of the time was the effort being made and encouraged by OSS to improve construction and retail sales statistics. An interesting omen, in 1965, OSS chaired a Petroleum Study Group directed toward developing better measures of reserves, productive capacity, wells, and revenues.

Furthermore, social and demographic statistics were being given much more recognition as new social action programs were developed. The Census Bureau was gearing up for its 1970 Census of Population and Housing and OSS took its usual role in assisting with the coordination of Federal agencies' needs for census data. More attention was given to the relationship of Federal, State, and local government statistical activities. Dr. Bowman was most interested in exploring the feasibility of a Federal statistical data center. However, it never enjoyed much popularity and eventually was completely rejected because of serious questions concerning confidentiality. Confidentiality issues continued to be important as they always were in the coordinating efforts of the Office of Statistical Standards.

Recent Developments in the Statistical Policy Division

In mid-1969 Julius Shiskin became the Assistant Director for Statistical Policy in the Bureau of the Budget. Mr. Shiskin viewed the office as having a broader function than that of setting statistical standards and proposed the new name of "Office of Statistical Policy." At the time Mr. Shiskin was appointed, Robert Mayo was the Director of BOB, soon to be succeeded by Dr. George Shultz who performed a dual role. Dr. Shultz was not only the Director of OMB (BOB's successor) but also one of President Nixon's principal economic advisers. Mr. Shiskin's background in the Bureau of the Census put him in a unique position to be of assistance to the Director and, hence, the President, in obtaining the most up-to-date economic information for use in national planning and policymaking. Much of the activity of the Office of Statistical Policy was directed toward improving economic statistics, chiefly the principal economic indicators.

President Nixon instructed the Director of the Bureau of the Budget to improve the timeliness of the principal economic indicators, many of which were disseminated too late after their reference periods to be of prompt value in policy formulation. Also, the President required a time separation between the publication of statistics and interpretations issued by policymaking officials.

These requirements were soon translated by the Office of Statistical Policy into memorandums to the agencies. The first of these required an advance schedule of publication dates for principal economic series be reported in the **Statistical Reporter.** The agencies were also required to attempt to reduce processing time between the close of a reference period and the publication of statistical information. It was also made a requirement that there be a separation of at least 1 hour between the issuance of statistical data and policy commentary by an appropriate official.

Another troublesome aspect of economic statistics was the frequency and magnitude of revisions made in the economic series. GNP figures were particularly affected by revisions so early estimates of GNP sometimes proved to be quite misleading. In

some cases, such as retail sales, greater budgetary provision was made to accommodate increased efforts toward improving the accuracy and timeliness of the indicators.

Major emphasis in the office was also given to the development of a pioneer publication, **Social Indicators**. While the office recognized the importance of this work, it was able to devote only one full-time position to its accomplishment. However, several persons from the Census Bureau were instrumental in the development of this major project. The concept of a consolidated statistical budget was emphasized and the interactions with the agencies in developing budgets were increased.

When President Nixon introduced his proposals for the consolidation of the departments of Government into four major departments, the Office of Statistical Policy proposed corresponding consolidation of statistical activities to parallel the departmental configuration. While the consolidation of government departments did not receive Congressional support, it did appear useful to continue to try to bring together the statistical activities of Government in a more economic framework.

At the Department of Commerce the Social and Economic Statistics Administration (SESA) was established to include the Census Bureau and the Bureau of Economic Analysis. It was hoped that a similar pattern could be developed among other agencies, concentrating data-collection activities and analytic capabilities to serve several organizational units. However, the complexities of achieving centralized statistical agencies, even within the major departments, have forestalled any real movement toward consolidation.

In the meantime, at the beginning of President Nixon's second term the scope of activities of the Budget Bureau were enlarged to include management functions and the office was renamed the Office of Management and Budget; Roy Ash is its present Director. This reorganization also resulted in changing the Office of Statistical Policy into the Division of Statistical Policy, within the management and operations part of OMB.

Statistical Planning and Coordination in the Mid-1970's

During the earlier discussion I tried to demonstrate the episodic character of the Federal statistical system. As individual economic and social problems have become evident or new social or economic programs defined, the Congress has authorized specific statistical activities to meet the needs of policymaking, program administration and general analysis of the social well-being. For most of this century there has been a growing effort to initiate effective planning and coordination of the many demands for statistical information associated with both congressional concerns and executive requirements. Presently, the major components of the U.S. Federal statistical system include the following:

1. General-Purpose Statistical Agencies
   - A. Bureau of the Census (U.S. Department of Commerce)
   - B. Bureau of Labor Statistics (Department of Labor)
   - C. Statistical Reporting Service (Department of Agriculture)
   - D. National Center for Health Statistics (Department of Health, Education, and Welfare)
   - E. National Center for Educational Statistics (Department of Health, Education, and Welfare)
2. Analytical and Research Agencies
   - A. Council of Economic Advisers (Executive Office of the President)
   - B. Economic Research Service (Department of Agriculture)
   - C. Bureau of Economic Analysis (U.S. Department of Commerce)
   - D. Board of Governors of the Federal Reserve System
   - E. Office of Policy Evaluation and Research, Manpower Administration (Department of Labor)
   - F. Consumer and Food Economics Institute, Agricultural Research Service (Department of Agriculture)
   - G. Bureau of Domestic Commerce (Department of Commerce)
   - H. Bureau of International Commerce (Department of Commerce)
   - I. Bureau of Mines (Department of the Interior)
   - J. National Energy Information Center (Federal Energy Administration)

In broad terms the organization of the Federal statistical system might be characterized by identifying the Statistical Policy Division of the Office of Management and Budget as the central office responsible for achieving an integrated and functional system of accurate governmental statistics, improving quality and reducing duplication in the data-collection and statistical functions.

The Federal system of Government including its statistical agencies involves many pluralistic approaches to various functions including division of labor among State and Federal governments. The general-purpose statistical agencies collect, compile, and publish data for general use in specified fields. The analytic and research agencies are major users of data collected by these as well as administrative and regulatory agencies and private sources. The analytical and research agencies do in some cases undertake direct collection of statistics as part of their activities. Finally, it should be noted that most of the major administrative, regulatory, and defense agencies collect statistical information connected with their administrative and operating responsibilities, such as the collection of taxes or regulation of public utilities. A few even have specialized statistical responsibilities such as the data collection on scientific activities associated with the National Science Foundation.

To complete the picture it should be noted that the private sector relies heavily upon Federal data collection and analysis in its daily decisionmaking. For example, marketing research departments of large corporations intensively utilize current economic data, the decennial census results, and published regulatory information to determine market strategy. Many individual citizens evaluate their own situations in terms of general demographic profiles concerning basic patterns, such as trends in cost of living and wage settlements. State and local governments rely heavily upon Federal statistics in an effort to formulate effective policies within their areas of jurisdiction.

In summary, it is evident that the Federal statistical system is a collection of relatively independent activities designed to meet relatively specific needs associated with a wide range of user groups including Congress, the executive branch, and the private sector.

For the past 20 years there has been a specific effort to reduce the burden of statistical data collection on individual respondents. As mentioned earlier, the primary policy device for

accomplishing this objective is the Federal Reports Act of 1942 which is administered by the Statistical Policy Division. To evaluate the many demands for data collection an overall set of priorities for the statistical system is essential, as is measurement of efforts to coordinate programs and data of various agencies.

In the past, an important device for enhancing this coordination and planning has been a variety of interagency committees, many of which are formally chaired by the Statistical Policy Division. (See appendix.) Many other committees are appointed for specific needs on an ad hoc basis. The Statistical Policy Division is also advised by committees outside government. These help SPD maintain wide perspective on national statistical issues.

A second technique for achieving planning and coordination is through the budget process in which the individual agencies present their plans, programs, and request for resources, both dollars and manpower. In each budget review all agencies are questioned concerning statistical plans and programs, and decisions are made concerning the overall direction of the Federal statistical program. As final statistical budget decisions are developed they are included in the budget proposed to the Congress.

It should be noted, however, that there are a number of factors which influence the final outcome of the statistical program not represented by the planning and budget decisions. These include the following:

1. Budget proposals of statistical agencies are typically screened within their departments prior to submission. Consequently, needs perceived by statisticians in some agencies may not receive full attention.
2. The final statistical budget decisions must be satisfactorily integrated to overall departmental decisions. Statistical programs which have widespread support sometimes do not survive the interdepartmental priority process even if generally supported. It should be noted that, in program agencies, provisions for statistical budgets are not always clearly identified as such and are regarded as part of the overall program. In that case, the statistical provisions generally have the same budget fate as the programs to which they are attached.
3. Proposals of the executive branch, as presented in the President's budget message, may not be enacted as proposed. The Congress, during appropriation hearings and voting, frequently adjusts statistical programs by eliminating some and requesting others not previously included.
4. Finally, after programs are established, the evolution of programs within the basic budgets of agencies frequently develops on an incremental basis which permits many adjustments and revisions which were not contemplated in the initial planning. Typically, these take the form of program improvements and result in more efficient data collection or analysis. However, occasionally there are instances where an agency decision to eliminate a particular survey or item of data has implications for users who are not participants in the initial decision to revise a survey.

On an overall basis this complex process has yielded a statistical system which is unsurpassed in the world. This certainly speaks well for past decisionmaking and for the talents of the statisticians who work throughout the Federal Government.

An Evolving Planning System

Despite the major accomplishments which have been noted and the long-term effort at coordination it is evident that several major problems exist in 1974. Simply stated these include—

1. Large-scale programs of data collection relative to social problems have grown rapidly and in a relatively uncoordinated fashion, as a result of the social program initiatives of the mid-1960's. In the absence of a social accounting framework equivalent to the national economic accounts it is particularly difficult to establish conclusive priorities among these expensive and demanding social statistical programs.
2. The inflationary pressures of the past 2 years have created exceptional demands on economic statistics and revealed several methodological weaknesses in conceptual programs designed to deal primarily with relatively price-stable environments.
3. Pressures to increase confidentiality of individual records are in direct conflict with the trend during the past 20 years to use administrative records for statistical purposes. Techniques must be identified for meeting the dual objectives of protecting individual records and at the same time providing mechanisms for interchange for statistical purposes which will not affect the rights and privileges of the individual and which will assure consistent data.

In order to meet these problems more effectively the Statistical Policy Division is initiating a more structured planning and coordination program in addition to the normal budget and forms-clearance functions which have been so effective in the past.[14] The new process focuses on developing a longer time perspective on statistical programs by identifying major long-term data programs and assuring even broader participation in priority setting.

The details of this process are evolving but the results will be a product of decisions made through the Interagency Committee on Statistical Policy and Programs which includes the heads of all major statistical agencies.

Let me now turn to current activities of the Statistical Policy Division as they relate to developing and leading a planning process for the Federal Statistical System. In order to systematize the discussion I would like to refer to the flow chart which identifies some of the elements of the planning process.

Description of Steps in Statistical Planning Process

The flow chart illustrates the iterative nature of the statistical planning process. Consequently, the following outline is descriptive and does not represent a sequential statement:

1. **Formulate ultimate objective**—the ultimate objectives of the statistical system are derived from government policymakers, congressional priorities, and private decision requirements.

[14] **Statistical Reporter,** "Developing Better Long Range Plans for Federal Statistics," October 1974, pp. 49-54. Published subsequent to presentation.

2. **Assess systemwide needs**—the needs of system are defined by comparing ultimate objectives with the existing statistical programs. Needs reflect gaps in the present system.

3. **Identify constraints and resources**—the constraints on the total Federal statistical system are the budget and personnel. A long range plan must address the full cost of statistical programs including all stages of design, collection, processing, dissemination, and analyisis. The personnel available must be balanced in terms of providing training and staff development of new staff and utilization of existing staff.

4. **Develop systemwide objectives**—these objectives may be related to the total statistical system or to a subsystem such as the census operation.

5. **Develop program structure**—given the systemwide objectives, the program structure is developed by examining alternative methodologies and selecting the most appropriate one in relation to available resources.

6. **Perform program analysis**—the selection of the most appropriate approach also results in internal improvement of the program structure.

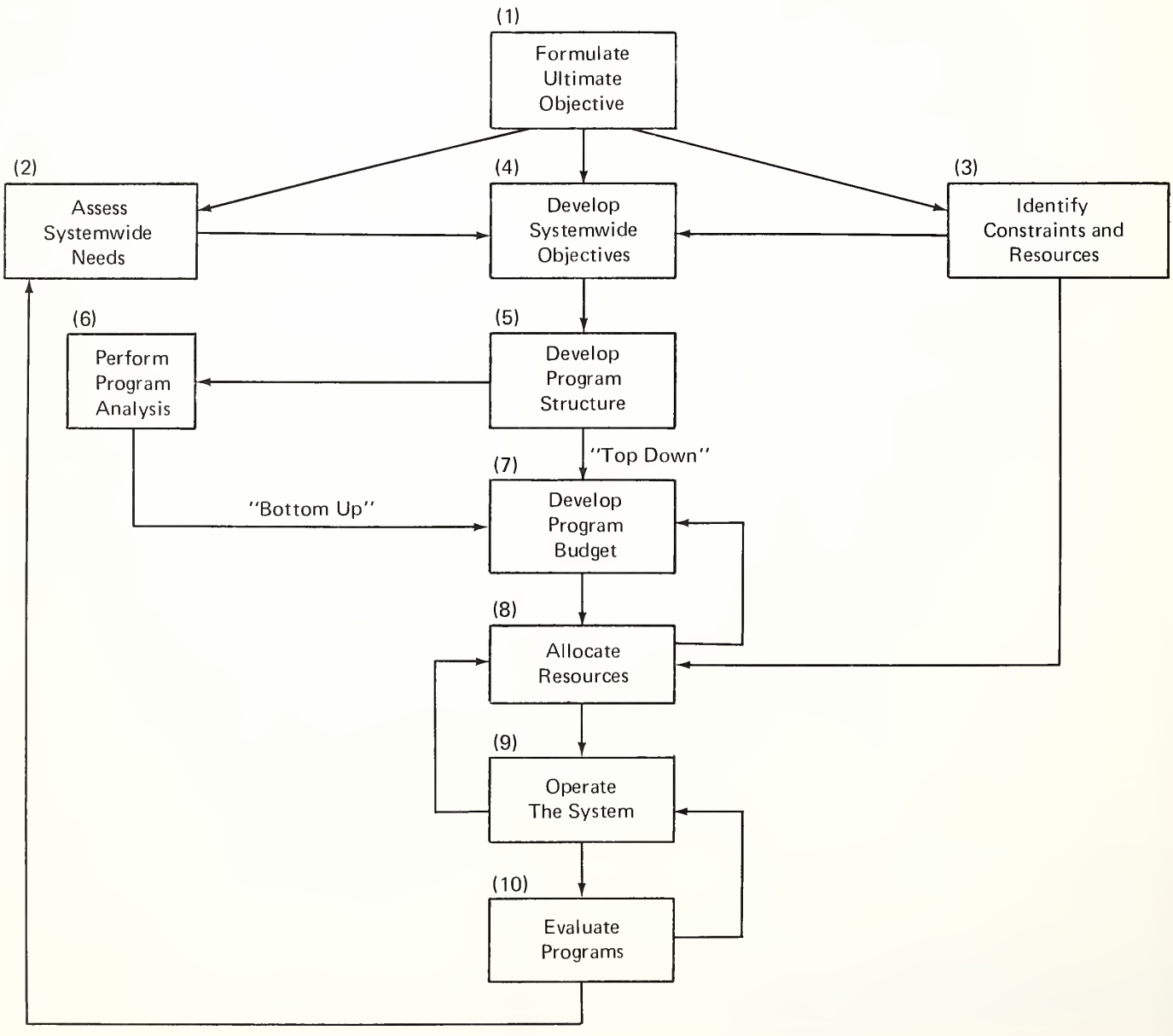
7. **Develop program budget**—the program budget is the result of relating available resources with alternative methodologies to yield the optimum allocation of resources.

8. **Allocate resources**—because available resources are allocated among several programs there is a requirement to reexamine program priorities before the final allocation of available resources.

9. **Operate the system**—the implementation of the methodology may require us to augment or reduce allocated resources as experience determines the utility of the budget decision.

10. **Evaluate programs**—as the system functions the evaluation of the final product may require modifications in operation of the system or result in the definition of major gaps in statistical information in relation to the overall needs.

Steps in the Statistical Planning Process



In reality much of the planning of statistical programs begins in box 5. Individual agencies, based upon legislative requirements, establish a program of statistics. The cost of the program is estimated (box 7) and, within individual departments, the budget for statistics competes with other program demands.

Also, in the present system as the statistical programs operate (box 9) there is evaluation by the Statistical Policy Division and by users. This evaluation feeds back on the operation of the system.

A significant part of program innovation actually occurs through the "bottom-up" process where statisticians in agencies, based upon analysis of statistical programs and their deficiencies, develop program budgets for improved utilization of resources to achieve the overall statistical needs. The other boxes on this chart are not totally inactive, however they are not systematically employed. Our objective in developing the statistical system planning process is to activate remaining boxes and develop more effective processes for priority setting in allocation of resources.

It is our view that this relatively straightforward planning process will be effective only if it is characterized by active participation. For example, the definition of needs involves many kinds of users of Federal statistics such as policymakers within the government, analysts in the various agencies, and the private sector including business, academia, and individual citizens.

A fundamental responsibility, therefore, is to assure that the planning process provides adequate opportunity for participation and involvement of both Federal statisticians and various user representatives. Additionally, given the vast scope of this enterprise, when one considers the range of Federal statistical activities, it is evident that the primary role of the Statistical Policy Division must be catalytic, with the substantive effort largely accomplished through the major statistical agencies. The primary responsibility of the Statistical Policy Division is that of the integration of the perspectives of the various agencies and a balancing of needs and demands for staff and budget across the governmental structure.

The tradition of a central focal point for statistical planning and coordination has been well established; and it works. Obviously, there has to be some kind of effort to avoid fragmentation of statistical activities. And, I think we have moved a long way in the proper direction of developing adequate collection capabilities in major agencies such as the Census Bureau, assuring major statistical requirements are well covered professionally.

However, I do see an important need to do a more systematic job of defining the needs for information within the agencies and among the many decisionmakers, both within governments and the private sector. For example, in order to better define these needs, beginning this month, we are to hold conferences with State and local governments to determine requirements from their prespectives. Having defined and analyzed various needs, we shall work with the statistical agencies in establishing priorities in terms of their work and programs.

The Office of Management and Budget is concerned, on a yearly basis, with the priority question of applying limited resources to proposed statistical programs. The flow chart was an attempt to illustrate the procedures for identifying the various participants' activities and distributing funds from a total resource of $300 million to $400 million. Unfortunately, $300 million in a $300 billion budget will not receive the prime attention of all of the budget examiners. I view an important part of my job as providing a rational and professional judgement concerning the statistical programs we recommend.

Mr. Barabba: Let me just amplify a problem that further compounds this situation. For the Bureau's reimbursable activities, we receive the dollars to conduct these activities from other agencies or from the public sector. But this does not mean that we are allowed a corresponding allocation for staff. So, we have to ask Dr. Duncan to negotiate a waiver, if necessary, for additional personnel.

Another example results from the energy crisis. We are allowed a specified number of miles of reimbursable travel. Thus we may have the personnel and the dollars to conduct a survey but need Dr. Duncan's assistance to obtain permission for additional reimbursable travel.

Dr. Duncan: Now I would like to believe that what I am about to say is not true but I haven't had any evidence to the contrary. Basically the system stops at box 9 of the chart. For example, from an efficiency point of view there is only a limited amount of internal evaluation of data collection. The system certainly does not have a complete evaluation of systemwide needs going back to systemwide priorities. There is a small amount of feedback within agencies, such as program evaluation of procedures, techniques, and utility of surveys.

I'm hoping to establish the mechanics of this chart as a real process. That's not going to happen in a very short time. It's going to take a number of years, at least.

We've mapped out a program which has some pilot activities for the fiscal 1976 budget season which starts in September. The overall planning process is really gearing up for fiscal year 1977. Let me tell you about some of the elements within that planning process.

First, during the fiscal 1976 budget cycle, we are going to undertake a partial evaluation of programs in wage and price statistics within the Bureau of Labor Statistics. Consideration is made of program purpose, authorization, techniques, cost and appropriateness.

Second, we, through our interagency committees, have established programs to determine existing data needs. For example, a number of departments need better information on family income, expenditure, and wealth. Some agencies would like to know how much income is spent on various kinds of health care, and so they do a specialized survey. It could be more appropriate to combine the health expenditure survey with a survey of total consumer expenditures to provide a better framework.

Also, we are presently holding meetings around the country to learn the statistical needs of State governments. We know the legislative demands for revenue sharing and related activities, but we would like to develop programs to help the States meet both their own and Federal needs.

We have had, for many years, active outside advisory committees. For example, the Federal Statistics Users' Conference represents a formal structure complete with staff that is available to advise the whole Federal statistical system on behalf of business, labor, nonprofit institutions, and associations. The Business Advisory Council on Federal Reports has business representatives who help assess the reporting burden implied by various survey proposals submitted to OMB.

Student: From what specific areas do you draw these people?

Dr. Duncan: They're drawn from large businesses. Typically, they represent comptrollers' offices of very large companies—people who actually fill out survey forms. A number of associations are represented, including several small business associations. The Chamber of Commerce also represents small businesses . It's hard to get small businessmen to devote a lot of time to advisory committees, but we try to give attention to their specific concerns. We also have professional groups that advise us.

Today we are asking for input about priorities and concepts of statistical systems. A little later, as we begin to see new program needs, we will have both internal and external groups discuss individual proposals for programs.

Under the Budget Reform Act of 1974 an organization equivalent to OMB is being established in the Congress. I don't know if Congress intends to include a division for statistical policy, but there certainly will be provision for defining the informational needs of Congress. Recently, congressional committees have been fairly explicit as to what they would like to have, but we're hoping for a broader statement of congressional information needs.

My main point is that the definitions of the ultimate and systemwide objectives have to involve statistical systems of agencies and all of the major users and this is a long process. A number of activities are beginning, in a piecemeal way, to identify these goals in a fashion which can contribute to a more rational planning system.

Let me just mention some other items which are central to the system the flow chart describes. Within the budget process, I hope we can move in the direction of a distinct statistical budget; an identification of constraints and resources in terms of both people and money for the total statistical community.

I feel strongly about the people side of the system. We don't really have a good measure today of the skills and capabilities of statisticians in our Government. We don't have the kind of system that exists in some countries. Great Britain, for example, has a Civil Service corps called Statisticians. In their fifth year of service the Chief Statistician in Britain interviews every statistician about his or her career plans. He then follows through working on personnel exchange and training of the more promising statisticians. I sense a need to make the job of Federal statistician an enticing one with great opportunities for the individual, in order to bring in needed new talent to help solve the great statistical problems facing us. Mr. Barabba has taken this approach within his agency and we have other agency heads that do so as well.

Student: Is this selection of statisticians controlled by the Civil Service?

Dr. Duncan: No, the Civil Service does not operate on a job title basis. I think there is a need to identify the career goals of young people in government. If we are going to talk about improved Federal-State cooperative programs, we will also have to do a great deal to influence the development of statistical capability, professionally, at the State level.

Student: Isn't there a general mission for the statistical bureaus in each of the executive departments to collect the data upon which their programs are implemented and evaluated?

Dr. Duncan: There are a great variety of purposes for the statistical components of the departments. For example, it is certainly true that the Bureau of Labor Statistics was initially established to collect statistics about and for the labor movement. The Consumer Price Index, to some extent, was tailored to urban labor and blue-collar workers. Recently, when there was a proposal to expand coverage of the CPI to include more people, that is, elderly, poor, and white-collar workers, the labor movement raised a great outcry. They said that the BLS was destroying a vital tool, which is used in labor negotiations. The inclusion of all those other people made the CPI less useful for labor.

My point is that the history of this matter illustrates a struggle in statistical agencies between planning for the future and meeting immediate and continuing policy needs. Over time statistical programs evolve into programs with new orientations. Data on program administration evolve into data on program evaluation. As administrative data become available covering several years, a time series develops and the data evolve into general-purpose statistics.

For example, in administering the Federal prison system information is collected on the number of prison cells available for occupancy throughout the country; in time, those data become a social indicator. Thus, general-purpose needs are imposed on various special purpose activities.

A goal of statistical policy is to understand this layering of needs, and to see to it that the Federal and nationwide statistical programs meet as broad a cross section of these needs as possible. That is not to minimize agency interests, but to encompass agency interests with some other concerns. That's the nature of our planning and coordination responsibility.

Student: The system that you are working to establish would formulate an ultimate objective related to the value of individual programs. Would this be a means for OMB to determine the allocation of funds to the various departments and agencies? Basically we are talking about money, aren't we, when we are talking about OMB?

Dr. Duncan: Yes and no. There is a management activity as well as a budget activity.

Student: I am trying to understand your goals in the context of the political role of the executive branch.

Dr. Duncan: There is no question about the fact that, when we get to box 4, **Systemwide Objectives,** we are speaking of the Federal statistical system, including all the departments and the executive branch of Government. What I try to do in terms of defining systemwide objectives is to keep in the forefront the objectives of serving the Congress and the various user groups both inside and outside Government. That's very idealistic but I believe it is consistent with the history of our office, and is essential to meet the needs of the late 1970's and the 1980's.

There are checks and balances in this kind of operation. In 1972, within the Office of Management and Budget, there was a desire to cut down on the Government's total budget. We went through a series of items and asked each department to find places where they could cut their budget. It was suggested, for example, that the census of agriculture be delayed and conducted at the same time as the economic censuses. It sounded like a pretty reasonable idea and it would have saved money. The Census Bureau went forward with a budget that did not include requests for dollars to conduct the census of agriculture. When

this decision reached the Congress of the United States, the executive branch was reminded that it was required by law to conduct a census of agriculture. Therefore, the Congress mandated that the Secretary of Commerce budget the agriculture survey. The check on OMB's action was, and is, that Congress authorizes the dollars.

Let me make another statement about our Federal Reports Act responsibility. Senator Thomas McIntyre wrote an article for **Reader's Digest** a couple of months ago in which he was very critical of OMB's administration of the Federal Reports Act over the years.[15] Because of this Congressional interest, we have initiated an independent outside evaluation to accomplish three objectives.

1. We want to define the total reporting burden for the typical small businessman, and its source. For example, there are many reports required by State and city agencies.
2. We have asked the evaluator to look at our processes of review and clearance. In addition to Statistical Policy Division personnel, many others participate in the clearance process. Budget examiners evaluate policy requirements. We receive outside advice from statisticians and the Business Advisory Council on Federal Reports and so forth. Obviously, we want a critical evaluation of the total process.
3. Based on these two findings we want the evaluator to outline the essentials of an ideal report clearance function, setting aside whatever constraints there are on the system at present. He has to look at what our real situation is, but he has the option to anticipate and design an ideal one.

My hope is that as a result of this activity we'll come up with an improvement to the report clearance process, and that the resulting activity will assist the planning coordination process.

I mention reporting burden because it is one of our two main legislative responsibilities. We anticipate some useful results from the contractor's study, and I think it will have an impact on the planning process.

Student: As regards the reporting burden, I fill out an income tax form for the Internal Revenue Service and as soon as I have that finished I get one from the State similar almost word for word to the IRS form. I recognize that the State has no doubt done quite a lot of work to standardize their procedures with the Federal Government, but it doesn't make it easier for me when I have to fill out two forms.

Dr. Duncan: I should like to add parenthetically that IRS forms are excluded from the Federal Reports Act and are, therefore, not subject to review in my office.

The reason for the different forms tends to be legislative. In the case of income taxes each State has its own legislation. We hope to see State statistical offices established with a responsibility for supervising the reporting burden similar to ours. Some States already have these. Once there is a State office with that responsibility, then the idea of using the same form for Federal and State governments can be introduced. Still the option, under our Constitution, is vested in the States. The State has to make the final decision. Tax forms are beautiful examples of where coordination could be highly effective.

Student: I am impressed with the amount of statistical information that the Census Bureau accumulates. Do you think you will ever get better dissemination of that information to the public? In other words, will you ever take it out of the hands of the politicians who only quote you the particular information expedient for their reelection?

Dr. Duncan: That's a very interesting comment. The researcher frequently has difficulty finding out what information is buried here and there. However, I don't really think that anybody is consciously trying to bury it. We have an incredibly complex system which generates a lot of different data. If you know what questions to ask, you can usually get the information.

We're making several attempts to improve the situation, but we have a very long way to go. One is a series of publications that identify what is available in the way of statistics and reports. The Census Bureau has a long list of such publications. The National Technical Information Service, another branch of the Department of Commerce, has recently issued a catalog dealing with available computer tapes. We are hoping to expand the publication of catalogs and directories concerning statistical information.

Mr. Barabba: I don't think there is any sort of effort on the part of any politician, at least not that I'm aware of, to withhold information. As a matter of fact, we don't deal directly with the politicians, we release information to the politicians on the basis of an OMB circular at the very same time we announce its availability to the public.

It's not a problem of anyone wanting to withhold information from the public. The problem is making it available to meet people's varied needs, and that becomes a very, very difficult task. Other agencies within or outside the Federal Government are considering this problem. One of these groups is the American Library Association.

We are now working on plans to involve ourselves in the education of librarians. We want them to learn how Census information can assist them in doing their job, so that by the time a person becomes accredited as a librarian or has completed a refresher course, knowledge of the use of Census data will have been a part of the curriculum.

Also, the land grant colleges have extension services funded by the Department of Agriculture to improve farming and the rural areas through new methodologies. As farming has become more and more of a business these extension programs have moved toward the problems of rural America from a planning and administration point of view. The extension program of Oklahoma State University has come to us with a very interesting proposal. It essentially says that they have an extensive communication network throughout the State of Oklahoma, with extension agents in every county, a television network reaching classrooms and facilities set up throughout each county. What they would like to do is to act as a Census agent for the distribution of information, but not for the collection. They want to build a program where they will actually go in and develop the best ways to teach people how to use Census information. If that sort of program were to happen on a national or regional basis we would approach a maximum of the potential distribution.

[15] **Reader's Digest**, April 1974, pp. 156-159.

In a sense, the Bureau is looking for outlets for all of its information. We have finally reached the point where we are fairly comfortable with the data we are producing. But, we still have a couple of problems in making data available in a useable fashion, and making them sufficiently accurate when they have been disaggregated for small areas. Also, we have to bring together the data and the people who are interested in them.

Dr. Duncan: To avoid political manipulation we have the directive which Mr. Barabba referred to; it is Circular A-91, which requires statistical agencies make advance notification as to when a report will be available.

Let me give you an example of why we would want to do that. Let's say that it is November in an election year. A candidate might want to delay the unemployment statistics because they are bad or to speed them up because they are good. Well, thanks to A-91 that's not possible. The publication date for the unemployment rate is announced 6 months in advance when no one is able to predict what the future unemployment figures are likely to be.

Student: I really didn't mean manipulation in that sense. I meant politicians who in their campaigns bring out only selected statistics, and the constituents don't have the knowledge to differentiate.

Mr. Barabba: This is why we have more than one person running for the same office. The critical element as regards information is whether the opposition, potential opposition, or anyone interested in a particular angle or aspect of an issue, has access to the information. Of course, this concept includes the provision that no single person has an advantage in timing as to when they can get the information. This is also extremely important. Dr. Duncan's operation makes sure that everybody who controls the information abides by rules governing the release of information. If there is a major technical problem involved in delivering on time, we have to give his office sufficient notice and show good reasons for the delay.

Student: You have alluded to standarizing Federal procedures and trying to integrate statistical procedures into a system that reduces overlap. Do you receive any feedback from the State or local governments concerning these problems? Also, what sort of statistical methods do you have or hope to develop to improve efficiency in making the data available in a more timely or relevant fashion?

Dr. Duncan: Take something like the State Employment Service. It collects wage data for administering State laws, but summarizes that data for Federal authorities according to a large manual of instructions, prepared by the Bureau of Labor Statistics. There is a tremendous amount of standardization in programs of that type.

Now there are other types of standardization. For example, we have a set of criteria for defining a standard metropolitan statistical area, including the level of commuting between counties, the density of the areas, and so forth. We frequently have interaction with States where they, for the purposes of sub-State regional planning, would like to use different standards.

Then there are detailed technical assistance programs. The Census Bureau has developed some methodology for making interim population forecasts between censuses. The Bureau actually certifies the procedures of certain States and lets them carry the responsibility for making the interim forecasts. I feel that we ought to do more of that sort of thing.

Mr. Barabba: The closest we have come to this is with the Center for National Health Statistics as it deals with vital statistics, where the center sets its own standards and then evaluates the numbers provided by counties and States.

As to methodology, the Bureau is finding a much greater desire by government agencies and the private sector to undertake sample surveys. Also, there's a lot of pressure on the Bureau to make more of its methodology known. Interestingly enough, I think we already make a significant effort in this area. Information on our methodologies is available in published monograph form. Yet, we are today coming to believe that even that is not enough. However, making methodologies available is not our specific mission and, therefore, we run into a problem with funding from the Congress.

Student: Is one of the central problems of regional and local governments the lack of knowledge and expertise of what resources are available?

Mr. Barabba: It's a massive problem! The central stumbling block is that some people are exceptionally sophisticated in the use of this resource, while others are very poor. Were we not faced with these different levels of understanding our task would be much easier.

If all counties kept their assessment records like Orange County, Calif., we perhaps wouldn't need the Internal Revenue Service records to conduct a census of agriculture. We could go right to the assessor's file for the sample. As a matter of fact, Representative Andrew Hinshaw, who used to be the assessor of Orange County and now sits on the Census Oversight Committee, has a dream of taking a census entirely from administrative records. He believes that if you leave it up to the assessors of America you can replace the Census Bureau. Whenever we do a study he asks us why we aren't using administrative records. But, on the other hand, another oversight committee asks us why we are using administrative records at all.

At any rate, there's a wide variety of standards and talent in the States. We, at the Bureau, can see the States increasing in their desire to do the job and right now the States have an economic surplus. It is the local areas that have financial problems, and this is one of the things that will play a key role in the subject of GBF files. These files will inevitably be a unifying device which will allow us to combine a lot of diffuse data.

Dr. Duncan: Two additional background comments. The American Statistical Association has through its local chapters gone into individual States and evaluated the job descriptions and the civil service requirements for State statisticians. A summary of these is available and being reviewed.

Second, as a result of our regional council consultations, which we are holding this month, we will probably be moving in the direction of having a national conference at which time we will determine which States have an interest in statistics. Hopefully, we will be able to move in a direction of getting some evaluation as to leading or lagging States and what can be done to improve the situation. Obviously, these problems exist in departments within States and so we can have a situation where a State is advanced in some areas and extremely poor in others. What we

are talking about at the moment is simply identifying those States that have a broad interest in developing a strong coordinated statistical program.

Student: Shortly our new President will be holding a summit meeting on inflation and presumably on the Federal budget. Could you tell us what the role of your agency will be as regards that meeting? Or what objectives you will try to convey to them, as an administrator?

Dr. Duncan: I have already been volunteering! I am thoroughly convinced that inflation has had a very serious deteriorating impact on our statistical system. As I mentioned earlier, I believe that these problems were becoming evident several years ago, and they are absolutely clear today. One of the things that we will be doing is working through the Council of Economic Advisors and through the Economic Policy Council to define priorities for improving statistics about the economy.

On a broader level, the Office of Management and Budget will be involved in the summit conference. Beyond doubt, a primary topic of discussion is going to be the Federal budget and the principles associated with keeping a balanced budget in fiscal 1976—an already stated goal. No doubt there will be some attention paid as to what can be done in fiscal 1975, although in that case things are pretty well set in place already. However, all of the appropriation bills have not been signed and this allows a degree of freedom.

You may be familiar with the fact that the Budget Reform Act of 1974 eliminated the President's ability to impound funds. For example, if the executive branch thought inflation was a critical problem, funds for approved programs could be withheld. To pump up the economy, funds previously impounded could be released. That approach is not open to the President today, and my guess would be that at that economic summit there will be a rather elaborate presentation by the OMB on both the nature of the budget and what it means to the decisionmaking process, as well as an explanation of the current budget and what actions are available.

Under current legislation, $198.4 billion of a $305 billion budget is preprogrammed into areas like the Social Security, as defined by law. That leaves roughly $100 billion to work with on a discretionary basis, of which defense and Federal employment represent a substantial portion.

The only way the Statistical Policy Division can have an impact on the budget is to have the budget examiners working with us. If the examiners feel our office is the mouthpiece of the Census Bureau, and we are simply saying "more statistics is good" without an objective perspective, they would stop listening to our advice.

Student: Is the "management by objective" system (MBO) more efficient than the Program Planning and Budget System?

Dr. Duncan: Yes, only because of the way the MBO process has been defined to date. There is nothing inherent in the process that should make it any easier.

Mr. Barabba: For example, I remember that we had a very difficult time trying to redirect our budget effort toward users. I assessed the main objectives of the MBO program and found an objective called "The New Federalism." Then, I asked the question, "Aside from giving this money back to the cities, do we need information as to the most efficient way to allocate the dollar?" The answer was "yes." I think it's a very efficient way to tackle problems.

Student: Is there a rule as to when a questionnaire comes in to your office that you're bound to give them an answer within a particular period of time?

Dr. Duncan: As far as our procedures go, there is no deadline. When someone comes to us for approval of a form we don't have to respond within any prescribed period of time. We try to handle the vast majority of requests within 2 weeks of their arrival. On the other hand I just received a list from one agency listing a dozen of their reports that we have had in our hands for an extended period.

Many times when we ask an agency to state why it is necessary to ask a certain question there is a long lag between our question and their reply. The difficult thing for most people viewing our system to understand is why we approve 95 percent of the requests. With that high an approval rate it doesn't appear that we are really doing our job. However, what that approval rate doesn't reveal is that many requests are withdrawn. Our system of accounting doesn't reflect the withdrawals.

Mr. Barabba: A lot of times a proposed questionnaire will come across my desk and I will know that its acceptance or rejection will be very close. So, my Forms Clearance Officer calls Dr. Duncan's Forms Clearance Officer and many times that form will never even go downtown.

Dr. Duncan: Then, too, we ultimately approve a lot of items that look very, very, different from their original form. We may end up approving a small agency request for a sample survey which was originally sent to us as a census. A lot of the small agencies get the idea that they should take a complete census of their particular area of interest.

We do not try to measure the proposed reporting burden coming into our office or the final burden that goes out to the public, but I am certain that it is considerably reduced by our review process.

Mr. Barabba: If we sent OMB a questionnaire that we felt was extremely important and they began to delete questions that we felt would alter the nature of the survey or make the survey meaningless we would have to go through negotiations.

APPENDIX

STATISTICAL POLICY DIVISION INTERAGENCY COMMITTEES

1. Interagency Committee on Balance of Payments Statistics
2. Interagency Advisory Committee on Defense Indicators
3. Interagency Committee on Foreign Trade Statistics
4. Interagency Committee on Foreign Trade Commodity Classification
5. Committee on Income Distribution Statistics
6. Technical Committee on Industrial Classification
7. Federal Committee on International Statistics
8. Interagency Committee on Output and Productivity (formerly: Interagency Committee on Measurement of Real Output)
9. Occupational Classification Committee
10. Interagency Research Committee on Seasonal Adjustment
11. Federal Committee on Standard Metropolitan Statistical Areas
12. Statistical Reporter Editorial Committee
13. Policy Committee on Current Population Survey
14. Technical Committee on Labor Force Statistics
15. Interagency Committee on Statistical Program and Policy
16. Interagency Committee on Financial Statistics
17. Committee on Environmental Statistics
18. Committee on Price Statistics
19. Task Force on the Quarterly Financial Report
20. Technical Committee on Poverty Statistics
21. Interagency Committee on Social Indicators
22. Interagency Committee on GNP Statistics
23. Interagency Committee on Transportation Statistics
24. Task Force on Standard Statistical Establishment List
25. Committee on Statistical Methodology

COMMERCIAL USE OF CENSUS DATA

Max Eveleth, Jr., President, Urban Data Processing

"Another interesting thing is the mathematical calculation of the actual available living space within a census tract. You look at a tract and determine that there is not much room for growth. Therefore, the decision to open a restaurant surrounded by many tracts with a small growth potential is a negative one. On the other hand, we find a series of tracts which the model indicates over the last 3 years are growing. There's quite a bit of room in terms of livable space, and density is low. Wham! A major developer puts in a $28 million shopping center. These indexes and suggestions are very important."

Max Eveleth, Jr.

Mr. **Eveleth**: Good afternoon, I am Max Eveleth, president of Urban Data Processing of Boston. I'm from the "other world," to a certain extent, that is, "the capitalists and the exploiters."

Basically, during the last 2 or 2 1/2 years Urban Data Processing has dedicated itself, in very simple terms, to trying to present to industry a manageable way of effectively utilizing the data and results of the 1970 census. There are a number of people on the staff of Urban Data Processing that came out of the Census Bureau's census test program conducted in New Haven, Conn. These people are very knowledgeable about census data and the systems that the Census Bureau has developed.

Primarily, we look upon ourselves as being in the market segmentation business. For the first 3 years of Urban Data the boys were developing software systems, packages, and specialized subsets of the 1970 census data, with the express purpose of utilizing these in a marketing environment for private industry. Then, a couple of years ago, we had it all ready, and encountered the first problem. We asked industry, "Gee, are you using census data?" The guys said, "No, why would I want to do that?" We were forced to realize that before we could get a fellow excited about our fantastic resource program we really had to "turn him on" to the tremendous amount of data available that could be a very useful marketing information tool.

To explain the distinction between data and information, let me try to draw an analogy. If you got to the floor of the New York Stock Exchange at the end of a day of trading, the floor would be covered with buy/sell papers. Those are data. They tell you what stocks were bought and sold and how many of each. The tables that come out in the **Wall Street Journal** the next morning which sum this up and indicate price changes and shares traded are information. You can use that information very quickly to decide whether to maintain your holdings.

In the same way the Census Bureau has gathered an enormous amount of data. The challenge is to effectively and economically convert that data into information that you can use as a management input for marketing decisions.

The census questionnaire is designed to learn some basic information about the American people: who they are, where they are, where they came from, what kind of house they live in, and what facilities are available.

Census data cover a multitude of information, from the number of bathrooms in the home and whether the television receives a UHF signal, to how people get to work.

In an attempt to economize, the Census Bureau employed a mail-out/mail-back method to conduct the 1970 census in the 145 largest standard metropolitan statistical areas (SMSA's). Computers also contributed to efficiency and economy during the survey.

Census data are released on several levels, ranging from a single city block in some of the larger cities, and groups of city blocks or their counterparts outside the metro areas called enumeration districts, to SMSA census tracts, which contain approximately 4,000 persons, or municipal territories outside the SMSA. The information is released piecemeal in two major segments. The data collected from the survey of the entire population, which numbered 205 million in 1970, are disseminated in the three initial stages. Additional data from two sample surveys, collected within the decennial census, are the last three sets of information released. This information is gleaned from more than 70 million questionnaires.

We, at Urban Data Processing, are attempting to demonstrate to management groups the value of census-based data. We show them how data have been aggregated and can be available even at the block level. We're trying to give them an idea of segmenting the country and how the census units were designed.

A lot of private industry people actually believe, for the first time, that the government has taken into consideration the interest of business and created this incredible marketing system. We attempt to point out the needs of the people, and that the reasons why the census was established happen to coincide with those of business in terms of segmenting the markets.

One management practice that could be greatly enhanced through the use of census data is direct mail advertising. Some advertisers use a ZIP code to define a market area. However, such use of ZIP codes, designed by the Post Office to facilitate mail delivery, is a wasteful technique. Both the codes themselves change, because territories of individual post offices change, and the neighborhoods change, long after the families which originally made the area a good market are gone. Meanwhile, the advertiser may waste a small fortune advertising via ZIP codes.

However, census tracts, for which there are definite data about the residents, are not defined by ZIP codes. A ZIP-code area in Marina Del Rey, Calif., with a mean income of $10,000 is not a place where we're going to sell Porsche automobiles through the mail. Don't laugh. I have customers that sell $22,000 automobiles through the mail with great success.

Now, let's consider the census tracts inside the Marina Del Rey ZIP-code area. We find that the median income varies from under $6,000 to over $20,000. If I attempt to sell Porsches through the mail, I want to mail to those several contiguous

tracts within the community with the highest income level. Remember, if you sell that kind of product through the mail, you are probably spending $1.00 per brochure for postage, paper, printing, stuffing and handling. Therefore, if you can eliminate 20,000 unnecessary pieces, you save $20,000, and the message is going to the people you really want to contact.

The Census Bureau has released some data on the ZIP-code level, but restricted this amount because of the ZIP-code problems I mentioned before.

The best thing you can say about marketing via ZIP codes is it's better than nothing. Most of the people we talk to quickly see the benefits of working at the census tract level.

The thing that always comes up is the assumption that 1970 census data have no relevance in 1974. At the risk of bodily injury and embarrassment to ourselves, we stage a mini-sociology course which suggests people do things because of their own or other people's social expectations—roles they want to play, status they are seeking. Consumer characteristics can definitely be correlated to particular kinds of demographics, according to the Chicago School of Sociologists.

The validity of this conclusion has been studied. Basically, when someone moves out of a neighborhood, he doesn't tear down the house, he sells it. The person who buys a $150,000 home overlooking some country club in west Los Angeles with a swimming pool and seven bedrooms probably didn't just get out of the Army as a PFC, nor would it be a couple just retired at the age of 74. It is probably a person similar to the one who just moved.

One effective approach is for me to ask, "Have you ever moved into a neighborhood or bought a house without knowing or asking one thing about the area?" Did you ever just look at the house and say, "That's fine. I don't care about the neighbors, or their jobs, or their kids, or the school system. I want that house." Let me assure you, that doesn't happen. Basically, when people move in and out of neighborhoods, they're seeking their own level. They are sustaining the kind of homogeneity we find in census tracts.

Also, studies indicate there is a consistency among census tracts over time. If I gave you a list of the 100 census tracts in Los Angeles with the highest income level in 1970, and matched it to a similar list in 1974, the percentage of tracts appearing on both lists would be enormously high. Therefore, changes within census tracts are important to us only insofar as they alter the relationship of one tract to another.

Several companies are engaged in population projections. A planning group and a list compilation company have coordinated their efforts, and by April 1 of each year, they can estimate each census tract's population and housing counts, based on the number of automobiles and telephones in that area.

For example, if there is a census tract in Atlanta, Ga., which in 1970 had 14 people who lived in 3 households, and suddenly in 1973 there are 1,200 telephones installed in the tract and 900 automobiles, something has happened! (We don't obtain this updated information from the Census Bureau.) But, the whole idea is that if there's that kind of activity we should take note.

Another interesting thing being done is the mathematical calculation of the actual available living space within a census tract. You can look at a tract and determine that there is not much room for growth. Therefore, the decision to open a restaurant surrounded by many tracts with a small growth potential is a negative one. On the other hand, we find a series of tracts which the model indicates, over the last 3 years, are growing. There's quite a bit of room in terms of livable space, and the density is low. Wham! A major developer puts in a $28 million shopping center. These indexes and suggestions are very important.

What I'd like to do is talk about the two systems we developed to facilitate the use of this tremendous resource, the 1970 census. The first is called Area Profile Report System, which identifies large portions of contiguous land and the population located therein.

For instance, a branch bank is being planned in Harvard Square. In the past the market was defined by plotting a map and manually compiling the data of the census tracts therein—time consuming and certainly less than exciting. Moreover, not all the necessary data were printed.

We define the market area using half-mile radii. (Other geometrically defined areas can also be used for smaller or larger markets, such as police, fire, or health districts.) Using the half-mile measures we can base our study on block groups. (Although some data are published only at the census tract level, it can be broken down mathematically to estimates for the corresponding block groups.)[1]

The Census Bureau has solved the problem of going through all the information to find the pieces concerning those areas of interest. This they have done by attaching the latitude and longitude to the computerized form.

Mr. Barabba: Could you discuss the calculation of block group data from census tract data?

Mr. Eveleth: Basically, at the block group level we know how many houses, apartments, and people there are by block groups, and the average housing values. If we take the average family income, which is available at the tract level, it is our belief that there is a relationship between home values and family income. Based on population counts, we set up distribution factors. This system is very general and doesn't need to be precise.

Mr. Barabba: Let me make a point here. We recently received a letter from Senator Charles Percy inquiring about this type of work. Some other firms take an automobile registration list, or perhaps other listings of individuals available to private concerns, and find out what enumeration district or census tract a person lives in. Then they take the characteristics of that tract and do a small survey, relating their survey results with the tract data. They imply to their clients that they can provide individual information on a large number of census characteristics about each name on their lists. Sometimes the implication is that they actually tap the individual census records. This implication is, of course, erroneous. Although the mathematical calculation of certain characteristics only statistically approaches the real individuals in that tract, when these firms sell their lists, it's very easy to say, "We have an auto registration list, and we've tied into the Census Bureau data." When Senator Percy sees that, he is legitimately concerned, because we claim that we print only

[1] The process is called "Fourth Count"—approximately 13,000 cells of population and housing data for each of about 35,000 tracts and 35,000 census county subdivisions; also, about 30,000 cells of data for each county. Source: 1970 Census of Population and Housing, "Publications and Computer Tape Program."

aggregate statistics. That, in point of fact, is true. So he concludes that someone has learned to beat the system, and we find ourselves spending a lot of time explaining that these people are overselling their product. Granted, they have done a good job of using available data, and it is true that a specified individual is more likely to have these characteristics simply because he lives within a particular tract. That's good marketing. But, unfortunately, they oversell and leave the wrong impression.

Mr. Eveleth: When you talk about auto registration lists, I'd like to make a couple of comments. I think seven or eight States have now enacted legislation that the automobile registration list is proprietary and can't be released. You can check me on that. I think there are another 10 or 12 where legislation is currently in process. The interesting thing about an auto registration list is that if you go to a place like New York City, only 16.5 percent of the population own an automobile. There's another thing. Because I own a hardware store, it's much more appropriate for me, for tax purposes, to have the hardware store own my truck. I don't own the truck, XYZ Hardware Store does. And that fellow shows up as having no car.

The next thing you run across is the assigned values of these automobiles as a characteristic of the owner. It's called "reverse snobbery." This describes a fellow who makes $50,000 or $60,000 a year, but refuses to spend $7,000 every 2 years to buy a new car. He just drives his until it drops. This suggests the advertiser should not approach him through the mail. Basically, there are inherent weaknesses in their program.

Once we have created our file and added to each block group its latitude and longitude, all we have to do is calculate the potential bank site. The method, again using latitude and longitude, of defining the distances between the bank and the market members is simple geometry.

Let's return to Harvard Square. Having calculated the bank site, we look in half-mile intervals at our market area and its characteristics. All the appropriate data appear individually for each interval, and as part of the aggregate.

These data tell us the number of men and women in the area, by age, race, and marital status, as well as median age. Data about housing units include the number of rental and owner-occupied units, people per household, and average market values. There is information by occupation and education. Average and median income for families and unrelated individuals and data on the civilian work force are also presented. We show how people get to work and the number of cars available.

We even show how the home and water are heated. I don't know who originally included that as part of our report, but during a presentation in Tulsa, Okla., to a group of advertising executives, one fellow got very excited. One of his accounts was a 22-State distributor of bottled gas, and he never had any idea of the percentage of homes around the distributorships which used bottled gas.

Households, by the year built and by the year the present occupants moved in, are also part of the summary of findings. If I open a department store and 70 percent of the people within a 5-mile radius at the time of the census had lived there for over 10 years, the chances are the neighborhood is highly stable. And once I convince them to carry my credit card, the odds are 7 to 10 they will stay in the area, and I won't have the expense of selling the idea again.

On the other hand, in the Harvard Square area you see a tremendously high turnover. At the time of the census, 61 percent of the people had been there less than 2 years, which is exactly what you'd expect in the middle of a college campus. At that location, one would not be overly anxious to open a bank, or a department store that uses credit. But it might be great for a pizza parlor or hamburger stand.

Thus, in our summary of the census data and the most recent population estimate, the customer gets a very comprehensive display of the people within the distance specified. This system is used by fast food chains, branch banking systems, retailers, real estate developers, and other commercial interests.

I don't know anything about any one of the individuals within the area defined, but it's certainly going to be less expensive for me to promote my business through the mail than it would be to run a television campaign all over Boston just to get a hamburger stand going.

Student: Do you have any type of educational program which explains the uses of the data?

Mr. Eveleth: Let me answer that a number of ways. Number one, the presentation that you're seeing has become successful in serving that particular purpose. The system I have described has a combination sales brochure and user's guide that describes every piece of data in the report, how it was obtained, and what to look for.

An illustration of the small businessman using our data would be the "Big Beef King" hamburger stand buying a report from us and later selling the franchise for that site. In that case the report may well be used by the new franchise owner for marketing the product.

Student: Then, basically, you are data providers and don't really serve the function of analysis?

Mr. Eveleth: Let me use different words. As I said, there's a massive difference between data and information. The report I give a client relates to the specific site he's concerned with, and that's information. He cannot use data to make a business decision, but he can use this APR to make a business decision. Fundamentally, we convert data to information. We do not interpret. We don't do models. We basically try to reduce the data to useable information.

The second system we refer to as the ADAPT system. I no longer care about contiguous parcels of geography. Now I have a whole mess of names and addresses, for instance, everybody with a Saks Fifth Avenue credit card in southern California. I know some cardholders pay their bills more promptly than others, some buy more and charge more than others. But I really don't know what the "odds" are of a certain percentage living in owner-occupied dwellings, or apartments, or those that are college graduates. Nor do I know what percentage have an income in a certain range. If I could take those names and addresses and relate them to census data, it would be a giant step forward. It's not certain just because a person lives in a particular tract that is 99-percent homeowner-occupied that he isn't one of those who lives in an apartment. But it is probable that he owns his home.

The store credit manager, by correlating income and education data to known cardholders, can determine which of them live in the census tract with an average income of $15,000 or more. Realizing the store has penetrated only 20 percent of those in the high income market with credit cards—which is itself a very good percentage—he wants to solicit the remaining 80 percent.

We pull the names, addresses, and phone numbers of all the residents of that census tract and match them against those known cardholders. These "qualified prospects" can be checked against files in a national credit bureau. Then the store can contact, by mail or telephone, the credit-approved prospects.

If the store management is considering a new store, the planners can take a census tract map and mark the greatest penetration of credit cards. Opening the store in the middle of that penetration is practical, considering that if those customers spent that much money before when they had to travel to the store, it's probable they are going to patronize the new store and possibly spend greater amounts.

Here the uniquely important point is that I am going to take the files of a department store which contain a great deal of personal information about the individuals and their activities with that store, relate them to census data, and return them to the store. But, I don't sell that information to anyone else.

This correlation is referred to as geocoding. It is the merger of various files based on a geographic code, such as an address. Put simply, even ZIP coding mail is a form of geocoding. The census coding is more sophisticated.

It is also possible to generalize about certain characteristics of persons living outside an SMSA. But it is important to be careful not to compare data from different sized census units.

In order to geocode data—matching an address to some information so it can be packaged to suit a particular census unit—street directories are required. Originally, the systems to do this were called address coding guides, but now they have become dual independent map encoding (DIME) files, a component of geographic base files (GBF).

From a matching viewpoint these systems are similar. With an address such as 400 Adams St., Quincy, Mass., the computer goes to that section of the Boston address coding guide and finds the range of Adams Street where 400 is, in terms of census tract. Now, the resident is a member of a group, about which we have a massive amount of demographic data. However, the person is still not individually identifiable.

There are certain limitations in this system, because certain areas have not been geocoded. Also, old streets are changing and new ones constructed, so the maintenance of the files is a continuing process.

A national women's magazine serves as an illustration of why the sort of thing I'm describing is important in private industry. This particular magazine has two editions: a main edition and a second which is allegedly mailed to those subscribers that have the highest average income. If I'm selling scotch, I know from my research that 98 percent of the people who drink scotch have an income over $14,500. If I can just advertise in this small section it doesn't cost as much, and it is reaching a high income group. That's basically the reason behind the concept of multiple editions.

This particular magazine created its high income edition based upon a ZIP code. We took one of those ZIP codes, Melrose, Mass., as an example because it has four census tracts within it. In this particular case, the magazine had 900 subscribers in the area, and they wanted to evaluate whether those 900 readers should receive the high income edition.

Melrose is a middle-income type of community. It's a very firm community in the sense that there are probably only five or six lots suitable for new construction in that city. The average age of the homes is perhaps 15 to 18 years. Let's get to know Melrose a little better.

This is the first count, 100-percent data for the city of Melrose. Notice that in addition to just giving straight answers to the question, the Bureau has, in fact, created a number of tables. In table 1 we can see the relationship between black or white occupants relative to number of rooms, availability of plumbing facilities, and so on.

This second table displays more data describing Melrose. This is fourth-count data for the entire city of Melrose, where the average family income is $13,900.

We also get a rough idea of education—people who attend college, male and female. There are about 2,800 people with a very high income in the city. We've got 10,200 homes and 33,000 people, right on the national average of about 3.1 persons per household. This is the level at which the publisher made his decision. Let's look at the individual census tracts for the same city (table 3).

The first census tract (3361) has an average family income of $13,700. Everything is nicely balanced. The next census tract (3362) has an average income of $17,515, 25 percent higher than the rest of that ZIP code—than the rest of that city. There they are, gentlemen—the "fat cats" all together. Of the 1,000 subscribers the publisher has in this ZIP code, there are over 600 in this tract alone. Notice that the people in the very high income groupings, those with high levels of education and those engaged in the professional occupations, are concentrated here.

If, in fact, these are critical elements for a marketing campaign, and those are the only people you want, you just mail to that tract. All you need now are the names and addresses for the people in that tract.

This is the next tract, 3363. Our income goes down to $12,700. In the last tract we drop off to $12,400.

Student: How do you relate the census data to the name and address of a person?

Mr. Eveleth: To keep this simple, I have keypunched telephone directories and entered them into the computer, by name, address, and phone number. I matched the 52 million names and addresses supplied by the Valentine-Sherman Company against the GBF's for the United States and assigned to each particular person, if possible, the tract code. That's now in his record. When I say, "I want all the names and addresses that I have in tract 3748," I go into the computer, and I pull that information. Now, I won't get everybody who's actually there, because there are unlisted phones, people move, and others live in a tract that is geocoded.

Student: You have no way of knowing somebody's income at a particular address?

Mr. Eveleth: That's correct. All I know is that one person lives in a tract where the average income is $10,000, and another lives in a tract where the average income is $20,000. Therefore, if I'm going to market Playboy Club keys, I'm only contacting the fellow in the highest income tract. This means we lose some potential members in the $10,000 tract, but our record proves that this approach gains more than it loses.

Mr. Barabba: In a sense, the Census Bureau becomes that denominator, and the local data files become the numerator, because you're using local administrative records to identify

Table 1

STATE OF MASSACHUSETTS ** MCD= 155 MELROSE CITY

1 TOTAL POPULATION	33,180
2 TOTAL HOUSING UNITS	10,219

19 NEGRO AND OTHER RACES BY AGE	NEGRO MALE	NEGRO FEMALE	OTHER MALE	OTHER FEMALE
UNDER 5	8	2	5	13
5-14	5	3	11	27
15-24	5	11	14	10
25-34	9	3	12	16
35-44	4	2	14	10
45-54	0	3	6	5
55-64	6	4	5	3
65+	2	2	4	6
TOTAL	39	30	71	90

43A COUNT OF OWNER OCCUPIED UNITS WITH ALL PLUMBING FACILITIES FOR WHICH VALUE IS TABULATED	
	13
	78
	310
	1,157
	1,887
	2,096
	519
	90

44A COUNT OF RENTER OCCUPIED UNITS WITH ALL PLUMBING FACILITIES FOR WHICH VALUE IS TABULATED	
	18
	32
	252
	486
	521
	728
	590
	231
	8
	87

18 POPULATION BY AGE AND SEX	MALE	FEMALE
UNDER 5	1,339	1,275
5	299	272
6	338	328
7-9	1,006	956
10-13	1,369	1,386
14	322	369
15	348	338
16	307	308
17	293	310
18	233	285
19	216	273
20	185	229
21	181	259
22-24	590	770
25-34	1,791	1,817
35-44	1,749	1,901
45-54	1,789	2,026
55-59	827	949
60-61	306	402
62-64	434	558
65-74	584	1,557
75+	304	1,202
TOTAL	15,430	17,750

24 POPULATION 65 YEARS OLD AND OVER BY RELATIONSHIP	PERSONS 65 YEARS AND OVER
HEAD OF FAMILY	1,436
WIFE OF HEAD	819
OTHER FAMILY MEMBERS	688
MALE PRIMARY INDIVIDUAL	141
FEMALE PRIMARY INDIVIDUAL	909
NON-RELATIVE (BOARDERS)	120
INMATE OF INSTITUTION	222
OTHER IN GROUP QUARTERS	12

30 COUNT OF OCCUPIED UNITS BY PERSONS PER ROOM, TENURE AND RACE OF HEAD	PERSONS PER ROOM 1.00 OR LESS	1.01 TO 1.50	1.51 OR MORE
TOTAL OCCUPIED UNITS	9,646	341	56
OWNER OCCUPIED UNITS	6,748	253	22
RENTER OCCUPIED UNITS	2,898	88	34
TOTAL NEGRO OCCUPIED	18	1	0
NEGRO OWNER OCCUPIED	10	0	0
NEGRO RENTER OCCUPIED	8	1	0

46 OCCUPIED UNITS WITH 1.01 OR MORE PERSONS PER ROOM		47 HOUSING UNITS WITH	
HUSBAND-WIFE FAMILY	368	42	1.51 OR MORE PERSONS PER ROOM
OTHER FAMILY-MALE HEAD	3	1	
FAMILY W/ FEMALE HEAD	19	6	
PRIMARY INDIVIDUALS	7	7	

48 POPULATION IN UNITS WITH 1.01 OR MORE PERSONS PER ROOM		49 POPULATION IN UNITS WITH 1.51 OR MORE PERSONS PER ROOM	
A UNDER 18	1,723	181	
G 18 - 64	996	113	
E 65 AND OVER	68	35	

POPULATION AND UNITS BY PLUMBING FACILITIES	WITH ALL PLUMBING	LACKING PLUMBING
51 PERSONS IN OCCUPIED UNITS	32,559	219
52 PERSONS IN UNITS WITH 1.01 OR MORE PERSONS PER ROOM	2,743	44
53 COUNT OF FAMILIES	8,267	48

28A ROOMS IN OCCUPIED AND VACANT YEAR-ROUND HOUSING UNITS	
1 ROOM	147
2 ROOMS	301
3 ROOMS	818
4 ROOMS	1,119
5 ROOMS	1,474
6 ROOMS	2,747
7 ROOMS	1,780
8 PLUS	1,826

28B ROOMS IN ALL UNITS	COUNT OF ROOMS	41 HOUSING UNITS WITH ALL PLUMBING	LACKING PLUMBING
TOTAL OCCUPIED AND VACANT YEAR-ROUND	60,127	10,100	112
TOTAL OCCUPIED	59,288	9,936	107
OWNER OCCUPIED	47,083	6,979	44
RENTER OCCUPIED	12,205	2,957	63
NEGRO OCCUPIED	100	19	0
NEGRO OWNER	70	10	0
NEGRO RENTER	30	9	0
VACANT FOR RENT	277	64	3
VACANT FOR SALE	156	22	0

URBAN DATA PROCESSING, INCORPORATED
675 MASS. AVE
CAMBRIDGE, MASSACHUSETTS 02139

COPYRIGHT 1971

indexes. Now there have been developed different indexes relative to marketing.

Student: What do you do with the tapes when you are finished with the information?

Mr. Eveleth: I send them back to the client, and I live in sheer terror of losing one of those tapes. But I do not incorporate the client's data into our system.

Mr. Barabba: Incidentally, a number of people from industry suggested certain questions be included in the census questionnaire. If they had a good point, the Bureau would listen. The lobbyist for the national pet food industry suggested a count of

Table 2

1970 CENSUS OF POPULATION AND HOUSING — FOURTH-COUNT SUMMARY DATA (SAMPLE DATA)

*** FOURTH-COUNT POPULATION TALLIES ***

STATE OF MASSACHUSETTS — MCD = 155 = MELROSE — POPULATION = TOTAL POPULATION

URBAN DATA PROCESSING
675 MASSACHUSETTS AVE
CAMBRIDGE, MASS. 02139

COPYRIGHT 1972

76 FAMILY INCOME

	COUNT OF FAMILIES
UNDER $1,000	98
$ 1,000 - $ 1,999	90
$ 2,000 - $ 2,999	130
$ 3,000 - $ 3,999	162
$ 4,000 - $ 4,999	227
$ 5,000 - $ 5,999	272
$ 6,000 - $ 6,999	302
$ 7,000 - $ 7,999	401
$ 8,000 - $ 8,999	527
$ 9,000 - $ 9,999	550
$10,000 - $11,999	1,151
$12,000 - $14,999	1,411
$15,000 - $24,999	2,210
$25,000 - $49,999	631
$50,000 AND OVER	57

76 INCOME OF UNRELATED INDIVIDUALS 14 YEARS OLD AND OVER

	COUNT OF INDIVIDUALS
UNDER $1,000	275
$ 1,000 - $ 1,999	324
$ 2,000 - $ 2,999	271
$ 3,000 - $ 3,999	195
$ 4,000 - $ 4,999	193
$ 5,000 - $ 5,999	194
$ 6,000 - $ 6,999	135
$ 7,000 - $ 7,999	148
$ 8,000 - $ 8,999	124
$ 9,000 - $ 9,999	68
$10,000 - $11,999	96
$12,000 - $14,999	114
$15,000 - $24,999	49
$25,000 - $49,999	12
$50,000 AND OVER	0

42 POPULATION 25 YEARS OLD & OVER BY YEARS OF SCHOOL COMPLETED & SEX

	MALE	FEMALE
NO SCHOOL YRS COMPLETED	25	34
ELEMENTARY-		
1-4 YEARS	63	99
5-6 YEARS	197	176
7 YEARS	146	126
8 YEARS	463	630
HIGH SCHOOL-		
1-3 YEARS	1,475	1,515
4 YEARS	2,887	5,275
COLLEGE-		
1-3 YEARS	1,272	1,457
4 YEARS	1,065	801
5 YEARS	781	290

68 EMPLOYED POPULATION 14 YEARS AND OLDER BY OCCUPATION AND SEX

	MALE	FEMALE
PROFESSIONAL, TECHNICAL & KINDRED WORKERS	1,719	1,034
MANAGERS & ADMINISTRATORS, EXCEPT FARM	1,178	180
SALES WORKERS	807	350
CLERICAL AND KINDRED WORKERS	868	2,218
CRAFTSMEN, FOREMEN, AND KINDRED WORKERS	1,522	56
OPERATIVES, EXCEPT TRANSPORT	501	433
TRANSPORT EQUIPMENT OPERATIVES	363	0
LABORERS, EXCEPT FARM	314	15
FARMERS AND FARM MANAGERS	4	0
FARM LABORERS AND FOREMEN	0	0
SERVICE WORKERS, EXCEPT PRIVATE HOUSEHOLD	597	624
PRIVATE HOUSEHOLD WORKERS	8	44
OCCUPATION NOT REPORTED	350	264

1 AGGREGATE & FAMILY INCOME OF FAMILIES	114539750
AVERAGE FAMILY INCOME ($$)	13,936
3 AGGREGATE $ INCOME OF UNRELATED INDIVIDUALS 14 YEARS & OVER	11177700
AVERAGE UNRELATED INDIVIDUAL INCOME	5,083

126	100% POPULATION COUNT 33,180	127	100% HOUSING UNIT COUNT 10,219

the number of pets in a household. For the pet food industry that information would have been fantastic. But, there was no way the Bureau could justify such a question on the census form.

As I said earlier, it would have been ridiculous at one time to ask about plumbing facilities. Today, it's a much more legitimate question. Natural resources was another such question, but in 1970 we dealt extensively with how people got to work. Faced with diminished oil supplies, society has decided to find new modes of transportation. So, you need data on the local level, and we value suggestions from this level.

Regarding advertising through the mail, we, in this class, have mixed emotions about computer letters.

Mr. Eveleth: I'm offended by some of the ones I get, because I feel they think I'm an idiot. If they think that, because they repeat my name four times in a letter, I'm stupid enough to believe I got a personal letter, good luck to them. When I say a computerized letter, I am speaking of the way we do it, where the entire letter is printed on the computer. That's not what they call a "filler." It really looks like a typed letter. We use a special kind of print chain. The ink we use to stamp the signature, if you wet your finger and rub it, will smudge. One of the problems we have in judging the success of computer letters is that some people have refined the science to the point that the person has no idea it's a computer letter.

The contrasting reaction is getting a letter that says "Dear Customer," and offering me a charge card when I've had one with that same bank for 3 years. Then I wonder what kind of bank I do business with?

Student: Are you making this information available to consumer groups? Say, one of them wants to make a mailing to cover Marina Del Rey. Has anybody used your services?

Mr. Eveleth: Yes.

Student: Has it been successful?

Table 3

Census Tracts	Melrose			
	Tract 3361	Tract 3362	Tract 3363	Tract 3364
INCOME IN 1969 OF FAMILIES AND UNRELATED INDIVIDUALS				
All families	1 719	1 881	2 042	2 577
Less than $1,000	22	11	42	23
$1,000 to $1,999	16	20	19	35
$2,000 to $2,999	19	21	39	51
$3,000 to $3,999	39	36	37	50
$4,000 to $4,999	25	44	35	123
$5,000 to $5,999	47	25	69	131
$6,000 to $6,999	60	59	64	119
$7,000 to $7,999	83	87	142	89
$8,000 to $8,999	99	71	142	215
$9,000 to $9,999	137	79	138	196
$10,000 to $11,999	244	216	298	393
$12,000 to $14,999	305	235	419	452
$15,000 to $24,999	515	618	500	577
$25,000 to $49,999	93	326	93	119
$50,000 or more	15	33	5	4
Median income	$12 674	$15 591	$11 973	$11 305
Mean income	$13 719	$17 515	$12 769	$12 393
Families and unrelated individuals	2 177	2 204	2 346	3 691
Median income	$11 012	$13 730	$11 056	$9 301
Mean income	$11 861	$15 880	$11 606	$10 205
Unrelated individuals	458	323	304	1 114
Median income	$3 774	$5 208	$2 837	$4 521
Mean income	$4 887	$6 360	$3 795	$5 145
SCHOOL ENROLLMENT				
Enrolled persons, 3 to 34 years old	2 145	2 471	2 814	2 652
Nursery school	29	64	44	66
Public	14	7	-	10
Kindergarten	125	135	166	148
Public	110	129	166	143
Elementary	1 213	1 331	1 604	1 402
Public	1 176	1 163	1 520	1 073
High school	567	656	827	656
Public	540	585	782	611
College	211	285	173	380
Percent enrolled in school by age				
16 and 17 years	88 8	99 9	99 9	98 9
18 and 19 years	84 9	54 1	61 0	56 6
20 and 21 years	28 0	71 5	20 4	36 2
22 to 24 years	17 2	19 8	6 3	5 0
25 to 34 years	6 1	8 0	5 4	9 5
Percent 16 to 21 years not high school graduates and not enrolled in school	10 3	2 3	6 1	6 2
YEARS OF SCHOOL COMPLETED				
Persons, 25 years old and over	3 958	4 299	4 555	5 965
No school years completed	-	5	35	19
Elementary 1 to 4 years	22	25	15	100
5 to 7 years	74	85	196	290
8 years	182	202	338	371
High school 1 to 3 years	471	510	918	1 091
4 years	1 958	1 645	1 989	2 590
College 1 to 3 years	618	842	585	684
4 years or more	633	985	499	820
Median school years completed	12 6	12 8	12 4	12 4
Percent high school graduates	81 1	80 8	67 0	68 6

Census Tracts	Melrose			
	Tract 3361	Tract 3362	Tract 3363	Tract 3364
OCCUPATION				
Total employed, 16 years old and over	2 932	2 907	3 160	4 307
Professional, technical, and kindred workers	650	741	496	978
Health workers	82	137	76	191
Teachers, elementary and secondary schools	151	126	80	142
Managers and administrators, except farm	372	452	271	321
Salaried	348	437	251	293
Self employed in retail trade	8	10	14	19
Sales workers	273	298	286	317
Retail trade	105	99	155	155
Clerical and kindred workers	710	641	733	1 083
Craftsmen, foremen, and kindred workers	292	290	456	622
Construction craftsmen	64	65	124	161
Mechanics and repairmen	82	85	126	158
Operatives, except transport	215	203	286	337
Transport equipment operatives	83	41	116	133
Laborers, except farm	73	61	103	81
Farm workers	8	-	-	6
Service workers'	243	170	404	418
Cleaning and food service workers	113	88	158	167
Protective service workers	37	21	104	78
Personal and health service workers	81	56	137	152
Private household workers	13	10	9	11
Female employed, 16 years old and over	1 132	1 066	1 172	1 802
Professional, technical, and kindred workers	230	288	190	377
Teachers, elementary and secondary schools	96	108	54	109
Managers and administrators, except farm	51	50	30	53
Sales workers	102	50	99	111
Clerical and kindred workers	503	451	517	816
Secretaries, stenographers, and typists	246	220	181	316
Operatives, including transport	94	98	139	172
Other blue collar workers	12	27	10	22
Farm workers	-	-	-	-
Service workers, except private household	135	92	178	240
Private household workers	5	10	9	11
TYPE OF INCOME IN 1969 OF FAMILIES				
All families	1 719	1 881	2 042	2 577
With wage or salary income	1 584	1 657	1 847	2 303
Mean wage or salary income	$12 977	$14 779	$12 128	$11 259
With nonfarm self-employment income	121	301	129	299
Mean nonfarm self-employment income	$6 026	$13 468	$7 712	$8 522
With farm self employment income	-	-	6	14
Mean farm self-employment income	-	-	-	-
With Social Security income	307	490	463	596
Mean Social Security income	$1 767	$1 719	$1 698	$1 644
With public assistance or public welfare income	26	43	72	135
Mean public assistance or public welfare income	$1 265	$985	$1 265	$1 317
With other income	913	1 187	1 002	1 181
Mean other income	$1 886	$2 965	$1 795	$1 901

Mr. Eveleth: Yes.

Student: Have you done anything for organizations other than private industry?

Mr. Eveleth: We have become involved with a couple of projects. We've been active in the ABC Program which is a project for making arrangements for a group of underprivileged minority kids, primarily blacks, to move into a better environment, outside the ghetto. ABC will typically group 20 or 25 together, and they'll buy a house within a particular city or town. They're having difficulty finding communities receptive to this concept, because the ABC Program is financed by ABC funds for the first 2 years, with the city accepting the financial obligation thereafter. They have two men covering the entire United States trying to find cities. What we've been able to do is to say, "Of the 40 cities you're in, this is how they look. Your best programs are in these 25, and this is how they look. And that's the kind of city you ought to look for." Instead of looking at 30,000 places, they're looking at only a few specific examples.

Student: Would you comment on magazines selling lists of their subscribers to direct mail advertisers?

Mr. Eveleth: A lot of the publications do this, and they make some very good revenue. I can name direct mail businesses that have a million customers in the United States. But if they didn't rent the list, they'd lose $100,000 a year. Seriously, they run this massive multimillion dollar enterprise to keep that list turning over and to be able to rent it to other people.

There are two kinds of lists. There's a compiled list where somebody basically takes a telephone directory or an automobile registration list and puts it into the computer. All you know from a compiled list is that the person is in the phone book or has a registered automobile. The other kind of list is what they call a buyer list or a mail order list. You get on this type of list when you buy something through the mail, a magazine, something from a catalog, or some tulip bulbs, etc. It doesn't matter, you're on that list. These people then rent that list to another business who might say, "Anybody that buys tulip bulbs would be delighted with the array of accessories I have for planting tulip bulbs." The list is rented, and the pamphlet is mailed to you.

There has been a campaign, called "Mail Preference Service," conducted by the Direct Mail Marketing Association, which is an international association. In this program the consumer has the opportunity to fill out one card which is sent to every direct mailer in the United States asking for the removal of

his or her name and address. The response, over a period of 4 years of public relations effort encouraging people to do this, has been substantially less than 1 percent, despite the fact that the association feels it has reached a potential audience of well over 100 million people. In fact, out of approximately 100,000 people requesting forms to have their names removed from lists, only 40 percent have returned their forms. People love it, that's what it comes down to! The vast majority of people who get direct mail advertising today love it. If that isn't true with a majority of this group, keep in mind that this group, by definition, is not representative of the average.

Mr. Barabba: Let me ask this question. What would happen if Mr. Eveleth had been our first lecturer? What would your attitude have been towards him?

Student: Most of the class probably would have been hostile, because they wouldn't have understood the background or the implications. I think that's been one of the most edifying things about this class. We probably have greater sophistication about what all this means than we did a week ago.

Mr. Barabba: Looking ahead, we have a tough decision to face at the Bureau. When you finally get down to it, ask yourself, "What are the questions we'll ask?" I think you could probably make a pretty strong case, particularly in 1980, that anything relating to energy is going to have a higher priority than pet foods. But what kind of energy sources? You can't ask all of them. Which ones do you handle and which ones do you leave out? In the United Kingdom they ask questions of different samples so they'll end up reaching maybe 30 percent of the population on a sample basis. But it will be by a series of 5-, 10-, and 15-percent samples. You can ask more questions that way.

I think it's going to be an interesting dialogue that takes place between the Bureau and the Congress this time around, because last time around almost 50 percent of the Congressmen voted to cut the number of questions. Now we've entered into the 1970's, and we've found ourselves in an era of limited resources. My judgment is that the debate is going to be quite different this time. I think that's going to happen, although I'm not sure.

Student: On the other hand, if something is missed on the census, can't it be picked up on the Current Population Survey?

Mr. Barabba: Yes, but then it's not small-area data. You have to ask yourself what's the value of having this data at the small-area level? In some cases, it's quite important. In the case of journey to work, what's the sense of telling you that "X" number of people drive to work in Los Angeles, if I can't tell you from where they came? There's a report out that tells you how many people drive from Downey to Burbank, and what kind of people drive, how many are in the car, how many are single-passenger cars, and what kind of industry they're in. To use that as an example, if you just make the assumption that most of the people who work in manufacturing type jobs in Downey are at Douglas Aircraft and most people who are working in Burbank in manufacturing are at Lockheed, you really have to ask yourself why those people from Downey are driving to Lockheed, and why those people from Burbank are driving to Douglas. It's not a big deal when you've a lot of gas in your society, but if all of a sudden you have limited resources, is it worth it for Lockheed and Douglas to sit down and decide to trade employees?

Student: Will you be asking that on the decennial census?

Mr. Barabba: We did on the 1970 census.

THE EVOLUTION OF SOCIAL INDICATORS

Lee Preston, Professor, School of Management, State University of New York at Buffalo

"Our society is very big and what the rest of society does, either on its own initiative, or in response to various Federal activities, is extremely important. Studies, while they may include aspects of the Federal Government, start and end with the focus on society."

Lee Preston

Mr. Barabba: I first met Lee Preston through his association with the American Economic Association's Advisory Committee to the Census Bureau. He subsequently became the Chairman of that Committee, and, as such, plays a critical role in the development of its agenda relative to the Bureau and our impact on the Federal statistical system.

We haven't talked too much about advisory committees and their role at the Bureau, but, as I hope these seminars have demonstrated, the Bureau is a very diverse organization, which covers a tremendous range of subject matter areas in a great deal of depth. It's a little naive to assume that any Director could keep up with the varied areas that one is expected to deal with. You have to have a lot of faith in the people that work for you. In an attempt to review our activities, we do have a great reservoir of talent available to us through our advisory committees. In a sense, we make use of the advisory committees as sounding or review boards. These committees play a critical role for the Bureau, and Dr. Preston, in his position as Chairman, has a major responsibility to ensure that the Bureau stays sensitive to the needs of the people who rely on the data we provide.

Dr. Preston: As I understand it, and from the transcripts I have read, most of the presentations have dealt with some particular statistical area or type of data-gathering approach. Hopefully, today, it will be useful to step away from the impact of those presentations and try to see what the larger picture is about. I want to take a comprehensive look at this whole collection of activities and what they can be used for, and to put this all in some historical perspective. Then I want to turn to some of the particular applications of social indicators, which are very new uses for these sets of data.

Images of Society

I think the idea behind any activity is important and it's all too easy to lose the underlying idea in discussing these sorts of data. In thinking about how to underscore that thought, I turned to Kenneth Boulding's little book, **The Image,** which was published some years ago.[1] If you have never read it you ought to, because it is one of the most important creative works of modern social science.

"Image," of course, means something in the mind, the way you think about something, and Boulding says, "Image is the property of the individual person," that is, it's in the individual's mind. There is no image apart from that in the minds of people. That's what the image is. "The basic bond of any society . . . is a 'public image,' . . . the characteristics of which are shared by the individuals participating."

The way we think about society and, in fact, the existence of society as a behavioral phenomenon, means something about shared images, shared ways of thinking among the people who are members. Whether one thinks of the existence of a society and oneself as a member, a dropout, or a member of some other society, depends on the commonality of image. This commonality is a basic understanding about the way the world is. We understand it together and because we do understand it together that brings us into a set of social relationships that is not shared by people that don't understand it that way.

This is a very general notion, but Boulding speaks at length about the rise in the self-consciousness of the image of society. That consciousness is the shift in modernizing and developing societies from an unawareness or a lack of self-consciousness to a self-consciousness. You probably are aware that in very primitive societies it is quite typical to find no term at all to indicate the society itself, nor a term for any other. In very primitive cultures the people usually refer to themselves as "the people" or "the folk" or "us" and they don't have any word for anybody else because they don't think about anybody else. By not thinking about anybody else, they don't really think of themselves as different from anybody else. They are the whole world. It's like a child's view of the world. That world is his block and he doesn't really have an image of any world beyond that block. Then, as he begins to develop an image of the world beyond his block, he develops an image of that block existing in relation to the images of that broader world.

What does all this have to do with our seminar? In the whole realm of data and statistical development we are acting out Boulding's notion of the increasing self-consciousness of the social image. We say that we are conscious of ourselves as being in society, and with that consciousness we, then, have some things we want to know about ourselves which, until we were conscious of ourselves, it would never have occurred to us to want to know.

The coming of consciousness—that there is a society and that it has characteristics—precedes and underlies the whole data development process. We don't want to collect data on the Gross National Product (GNP) until we have an idea of what that is. Now that's true of population, too. We didn't start collecting data on population until we had an idea of population, of a society with numbers of people in it. Then the question of how many people there are became a question of factual interest.

Remember, the conception—the image—comes first. The image determines behavior in this broad sense, as Boulding suggested. It is also important for our own immediate interest, in that we establish these data-collection systems and we collect

[1] Kenneth Boulding, **The Image**, University of Michigan, Ann Arbor, 1956; paperback edition, 1961; quotes from pages 54 and 64.

information. We save this, and don't save that, and assemble it in a variety of ways, in response to our image of the way society is and what things it's interested in, what things, as members, we are interested in. It's an interactive process.

As we articulate our self-characteristics we become more aware of them, and our image adapts to the process of data development and we begin to think that the GNP exists—which it doesn't. There is no such thing as the GNP; we made it up. We invented the GNP because we had a vision of the macroeconomy and wanted to get some ideas about its characteristics, dimensions, and parts. That led us to GNP development, and now much of our behavior is cast in terms of this image, GNP, which numerically represents the macroeconomy.

There is an interactive process between the image, this state of self-awareness, and information. We are always in it, and as our society becomes more self-aware and increases its interest in itself and in additional dimensions of its characteristics, we acquire information about those characteristics and that information refines the image. We go on evolving this image over time and it is never settled, never over. It's an ongoing phenomenon. That is particularly true in this important new area of social indicators, because what we are doing in the social indicators field is responding to the same points that were made in the discussion with Dr. Jones. He emphasized very strongly that the whole GNP idea, the total population idea, or any other type of single statistical analysis does not measure the full range of social characteristics of interest to the members of society.

What to Measure

The question of refining the GNP or adapting the GNP into a measure of economic welfare has been discussed. The social indicators approach, which contrasts sharply with that, accepts the fact that the GNP, any other economic index, or any other single kind of characteristic, is not the main thing. What the social indicators approach wants is a group of characteristics that are very important to society. What we want is a way of getting some kind of comprehensive and related reading on this group of interrelated characteristics, to prevent confusing weight with height. Both weight and height have to do with how big a person or a table is, yet weight and height are two different things. If we are really interested in sophisticated understanding of how big the table is, both its weight and height are of interest. Turning to a human being, both weight and height are of interest, but age and income are too; we don't want to collapse those all into one figure or index. We want to keep them separate, yet close together, so that they can be taken in by a single view of the comprehensive set of characteristics that are of interest.

If you take that viewpoint, you have joined the social indicators movement. Think of the concept as flowing from image to data. First, there are types of goals for social concern which relate to characteristics that members of society possess individually and collectively—image. Because we have these characteristics in common individually, we have them as a group and as a society. We're interested, for example, in whether people have good health, and we're not interested in whether they have blond or brown hair. We will not want to spend any time at all finding out about the hair, though we may want to spend time finding out about the health. We have the idea that society will improve if people are healthier. We don't think that way about hair, or even care whether people have any hair at all.

What is it that we're interested in? What are the things about society that matter to the members of society? These define the goals and concerns that give us ideas about accounts or indicators—the statistics, in other words—to be developed and monitored. What is it about society or about its members that you would like to know, to relate to your conceptions, your goals, your concerns, your interests?

Definition of "Indicator"

This is a good time to differentiate between accounts and indicators, because some literature makes a considerable point about that, whereas some people say, "Nonsense, don't worry about it; forget it, there's no difference." Well, both are right. But it's worth making a little distinction.

I'd like to quote to you the definition of social indicators out of the appendix to the book, **Toward a Social Report,**[2] which we will refer to later. This is as good a definition as any:

> A social indicator, as the term is used here, may be defined as a statistic of direct normative interest which facilitates judgments about the conditions of major aspects of society. It is, in all instances, a direct measure of welfare and is subject to the interpretation that, if it changes in the right direction and other things remain equal, things have gotten better or people are better off.

In other words, the area of concern improves or declines, depending on the movement in the indicator. The indicator is an output or performance statistic, not an input statistic. For example, it is said, "Statistics on the number of doctors or policemen could not be social indicators, whereas figures on health or crime rates could be."

That occasionally numbers representing doctors and policemen are used as social indicators is arguable. The reason is that you can take the number of doctors as an output of society and use it as an indicator. But numbers of doctors as an input is not a social indicator. The budget for public health in Los Angeles County is an input; it's not a social indicator as such. If you take it in perspective to the income of Los Angeles County and say that out of that income a certain amount is being allocated for health, that puts it in an output context; it is shown as a use of income. Then you could interpret it as a social indicator.

Student: When you talk about population versus policemen, sometimes people measure so many policemen per thousand population against the crime rate of a particular area and compare those rates with another city. This probably raises a lot more questions than answers.

Dr. Preston: I agree with your general point; but, you see, if something is not quantifiable, then you can't say it's correlated with something else, because you don't know. Then it can't be the indicator.

I do not think it is wise to make an issue about the difference between accounts and indicators. Most of the accounts that matter, such as the GNP accounts, are subject to such diverse

[2] **Toward a Social Report,** U.S. Department of Health, Education, and Welfare, 1969.

adjustment that they are essentially indicators themselves. There is a difference, for example, between the GNP and the most important GNP-related indicators.

Take the average number of weekly hours of work; that is an indicator, it is not an account. No one cares what the average number of weekly work hours is as an end in itself. We have no social theory about the average number of hours worked within the range varying around 40. We have sort of a norm about the hours, and we have fluctuations about the norm. The fluctuations are wonderful economic indicators, because one of the first ways that we know that the economy is expanding is when the hours of work increase, and one of the first ways we know that it's contracting is when they begin to decline. The reason average weekly hours is a good indicator is that it forecasts changes in the GNP. But you don't know the GNP—an account—until the next quarter or maybe two quarters afterwards, because you don't get the data in, but you know about those hours worked every week because of the payroll taxes.

Student: You're saying that an indicator is basically a subjective type of thing. You just arbitrarily, through some kind of social consensus, determine that 40 hours a week is an indicator?

Dr. Preston: No. The indicator is definitely an objective statistic. Indicators and accounts both are statistics. However, when you talk about an indicator, you are saying that you're not measuring the total item you're interested in. When you talk about a health indicator, you are not measuring health. You are kidding yourself that this is an index of health. It is not comprehensive. It does not tell you all about health, and don't think that by measuring it you have measured health in the abstract. You have something that when it goes up, other things being equal, health is improving. When it does down, other things being equal, health is deteriorating. Then you have an indicator of the change in the item (health) you're interested in.

We feel there is such a close connection between the GNP, our key example of an account, and the size of the macroeconomy that the GNP really is a measure of the size of the macroeconomy. If the GNP goes up or down that is it. The GNP is not indicating something; it is the thing itself. In the case of population changes, the population is the thing itself. We might have other items that indicate change in the population, say that we did not measure the population directly but we were able to measure changes in longevity. Other things being equal, if longevity increases population is going to increase. But longevity is by no means the population. That's another example of the difference between an indicator and an account.

Mr. Barabba: As I recall, the definition says that when something increases it is to the betterment of the objective or the concern, and when it decreases it is to the detriment.

Dr. Preston: Or the other way around. Certainly your goal can also be stability if that's the social consensus on the goal. It depends on the way the goal and the indicator are stated.

The idea of a social consensus affords us a vision of society's interests and allows us to develop the appropriate means for constructing statistical data, factual data, which may even be opinion data, to gain further understanding of our vision. I want to emphasize that point because the word "objective" is drifting into our dialogue. I am willing to stick with that, even though by "subjective" one might mean attitudinal or opinion data; and that kind of data goes into our vision as well. There is a very important difference between indicators and accounts because the indicator's movement makes substantial use of attitudinal and opinion data, that have no place in an accounting framework. For example, the questions in the new housing survey about attitudes toward one's neighborhood and toward housing are very important. This is a very desirable development and very much an "indicators" type of development. You don't count housing that way; although how people feel about housing is very important in order to understand whether they are satisfied or not.

Student: If I follow your construct here, it is analogous to, perhaps, the Gross National Product as an indicator with "X" number of economic accounts. You are going to have a social indicator with "X" number of social accounts.

Dr. Preston: No, sir. The GNP is definitely thought of as an account. It is primarily an attempt to measure the size of the macroeconomy and it is only because that concept is rather nebulous that the GNP becomes a kind of indicator of the size of the macroeconomy. It is as though you counted the population as only the people over 14 because for some reason you could not count all the babies. Or with the business population where you count only down to a certain size and then it is very difficult to count the smallest size firms because they are fugitive. They're in people's garages and you can't find them. There are many things that we consider hard statistics yet it turns out on examination that they are really indicators right there at the edge because you have the main part, but not all the information.

The other extreme is the kind of indicator where you have an entirely separate item, such as the average weekly hours of work. The indicator and the thing indicated are two separate phenomena. For most of these non-economic social areas we don't have any account aggregates to think about at the present time, and I do not see any real reason to anticipate that we will. We don't have an aggregate of health, although we have indicators of health. All we can say is that if all these health indicators are going up or down, infant mortality, longevity, days of sickness, disability, and so forth, health must be getting better or worse. There is not a concept of Gross National Health going from 90 to 95. We lack that idea.

From this conceptual level you travel to the actual measurement. This is the task that you want the accounts and indicators to perform. Measurement contains much of what you have been doing in this seminar with data development and as you have discovered there is a tremendous amount of interaction. That is, we try to measure things that will be relevant to our concepts, to develop statistics that will relate to our concepts of society. We must employ items that can be measured fairly economically and with a fair degree of accuracy. With this in mind we have begun redefining some of the indicators and accounts to correspond more closely with those things we can actually measure.

It all goes back to our society's state of self-consciousness. First, we develop the idea of "sick" versus "well." Then we have the idea that "sometimes we are hotter and sometimes colder" and this idea of hot and cold has some relation to "sick" and "well," which suggests the indicator. Then we develop a measurement to give us a precise indicator of temperature, which is related to our concern about "sick" and "well." Finally, we know our temperature and say, "Ah, that is our characteristic."

Student: The Dow theory in the stock market is similar to this, isn't it?

Dr. Preston: Yes, and there are lots of ways in which it turns out we use the measurement to substitute for the goal, but that's because the whole process is very circular, like all social processes.

Once we have the measurement, if we want to close the circle, we go on to policy or action, if relevant. The effect of action will be monitored by the measurement which reflects the underlying goals. We'll see that incomes are up or down, employment is more or less stable, or whatever it was that we aimed at in our policy and action. Hopefully, we will get measurements that will tell us what happened as a result of what we did, and then we'll know whether our policy and actions were favorable or unfavorable with respect to our concerns.

If we don't go that far, we may say, "O.K., now we know about ourselves, let's just see how it goes." Then we just go on living, but we also go on measuring. It's "living and measuring," instead of "living and not measuring." And in this case we simply find out how the characteristics we were interested in develop over time, even though we may not do anything to change them. This will go back to the point that a goal might be for something to remain stable. Maybe our policy will be a policy of leave it alone; but we'll still measure.

Mr. Barabba: These steps, even though they appear to simply represent the available scientific methodology, are all fraught with policy decisions. One of the best examples of this is the whole concern about eliminating poverty. The responsibility may be turned over to a group of technicians and they are told to measure poverty, yet no one ever checks the policy implications that took place in the development of that measurement.

Dr. Preston: Exactly. You go to measurement of earned income, because that's the easiest thing to do. You count all the people who have a certain level of earned income and then there are all these people left that are below that level, so they must be in poverty. Later you may find out that they're all on various academic scholarships or welfare programs, or living on farms where they are self-sustaining. So they really are not in poverty in terms of their living situation at all. It's not to say that there are not problems, or that these people are not disadvantaged; they may be, but they're not living in poverty in that sense. You have produced a result that is not relevant to what you had in mind at all, because the measurement phase was executed in a technical, "Let's just do it here in the laboratory," way instead of a full scale survey. That's why the image is so important. The idea underlying the whole process really matters.

History of Social Indicators

The social indicators movement fits into this process reasonably well. You have had the opportunity to read in the Bauer[3] book a couple of histories of the social indicators movement; and in my little paper there's also another very short one. I find that every one of these histories leaves some things in and takes some things out. If you will bear with me, I will give you one more capsule history of the social indicators movement to hopefully put this whole thing in perspective. Then, when we talk about the pieces, you won't lose the point that the pieces fit together in history and they fit together through a lot of interrelationships in this process.

The social indicators movement was stillborn twice. It was stillborn first in the Hoover Administration in the 1929 President's Commission on Recent Social Trends, headed by Wesley C. Mitchell, one of the most distinguished social scientists of his day. The Commission was established under a Presidential charter to study and prepare a report on recent social trends. It shows you the wonderful scholars they were that, in spite of the fact that the world collapsed around them, they continued to study the "recent social trends" based on data of various kinds, through 1928. They didn't extend their thought into 1929 at all. They produced a thick volume, published in 1933, called **Recent Social Trends,** which doesn't really mention the Great Depression. If it had been published in 1928, which was the post date that it reflects, it would have gone down in history as a major contribution to American social thinking. Published in 1933, it came out as a bizarre anachronism. Merely an historical document it went unnoticed directly into the library archives. Of course, nothing came from that exercise because the report was not even filed until the end of the Hoover Administration, and it reflected a conception of problems that was not appropriate for 1933.

The Social Trends Commission was followed by the TNEC, the Temporary National Economic Committee, a New Deal effort to study specifically the economy, but ranging into many other areas of social life, as well. That Committee had a long and very productive life and produced a huge set of studies which has been the foundation of a great deal of modern economic research. TNEC monographs, out of date now, stand as great milestones and many have become incorporated into regular Census Bureau series over the years. The TNEC effort might well have gone on into the whole social policy analysis on a broader scale. It was pointed in that direction, but World War II came along and that ended that. Again, the world changed beneath the analytic process underway, rendering it irrelevant to the crisis at hand.

There were no new developments until after the war. The most important was the economic report which was required by Congress in the Employment Act of 1946. The Employment Act was one of the most important pieces of social legislation in our history and the required economic report was a very significant dimension of the Act. The Act said that the Executive (i.e., the President) had to study the state of the whole economy—which runs all the way to the edge of the entire society and into world involvement—and to report and recommend to Congress specific actions. This was one of the few times that the Congress ever said that it took explicit responsibility for the whole of society, not just particular parts.

In the 1946 Employment Act the Congress said, "We now see that there is something out there called the macroeconomy. We didn't know that before." It's true they didn't know that before because nobody knew it. It was a new idea in the 1930's that there was such a thing as the macroeconomy. By 1946 that idea was well established and measurement devices had been developed to the point where they could start talking about it and asking for reports about specific items. Congress requested such a report in the Employment Act and the whole history of the economic reports has grown out of that.

The economic indicators are very closely associated with the economic report. In fact, as Dr. Jones mentioned, the idea of economic indicators goes back to the 19th century. Long before

[3] **Social Indicators,** Raymond Bauer, ed., MIT Press, Cambridge, Mass., 1966.

they had any idea of the macroeconomy stock market analysts, investors, and bankers, were looking at numbers similar to the economic reports, as clues to whether business was getting worse or better. They were in the indicator stage long before they were in the account stage. That's the point we are at today in most of the social concern areas. We're in the indicator stage. And the indicators have continued to be very important aspects of economic analysis and forecasting. The Council of Economic Advisers publishes a current series of economic indicators. Similarly, after the HEW Department was established it began two publications, **"HEW Trends,"** and one titled **"HEW Indicators,"** which relate to HEW areas of concern, as the economic report does to its indicators. But the HEW data were preliminary and involved very tentative ideas. Those are the ideas that went into the publication **Toward a Social Report,** which is so important that we will discuss it further in a moment.

Then, there's another trend which you have in Bauer's book, **Social Indicators,** which comes from an entirely different sort of orientation. The National Aeronautics and Space Administration from the outset had the idea that they should be looking at the effect of NASA's programs on society. NASA was going to be a vast program and also very different in terms of its characteristics from previous activities. It was going to end by putting people on the moon and we obviously had never done that before. That might have all kinds of effects. Also, at that time you could really see social reaction in the United States to the Soviet space program. In fact, NASA itself was a reaction to the Soviet space program. You may recall the kind of revolutionary tremors that occurred throughout American education after the Sputnik went up. We suddenly realized that some other country could do something in the scientific-educational line that we had not been able to do. That was the first time in a long time that had happened. All kinds of revolutionary changes flowed from that.

Jim Webb, who was the head of NASA in the early days, realized that NASA would have unknown though vast ramifications; ramifications such as the fact that our response to the Russian space program produced a change in American education. Therefore, he wanted to set up some way of monitoring NASA's impact on society. He asked Raymond Bauer, among other people, to participate in designing and undertaking such a study. Bauer combined this objective with a lot of his own interests, and those of other people. He concluded that what they needed was to begin to think about a set of basic characteristics of society, areas of primary concern, and to get a reading on where society was in relation to them. Then one could see how society was changing over time. You had to get a base line before you could make any measurement of changes. We needed to develop a set of concepts and techniques that would enable us to get it started. That's what they tried to do in the book, **Social Indicators.** They didn't really succeed in doing that, but they did produce some very important papers.

At that same time, another group coming out of the same intellectual background produced a book called **Indicators of Social Change.**[4] This was the work of Eleanor Sheldon and W. E. Moore, at the Russell Sage Foundation. They produced a very thick book which is similar to **Recent Social Trends,** in the sense that it has chapters on a lot of topics. It's not like Bauer's comprehensive, integrated approach, but the Sheldon and Moore book is a close companion to the Bauer book. Together, these represent a pattern of society's thinking to the end of the 1960's. These efforts mark the development of the measurement theme. It's about what we want to know, what kinds of accounts or indicators are relevant, and how they can be measured.

During the same period of the 1950's and 1960's, the "goals" theme was also important. The question is: What is it we desire? What are the basic areas of concern? What are the things we care about? That was an issue that appeared at the end of WW II, when there were clearly many efforts that could be undertaken, but we were uncertain which should be done. Of course, it came out of the Cold War. It's similar to primitive people first being confronted with another society. The white hunter comes and all of a sudden they realize that they're not the only people on the planet. In that realization they come to see characteristics about themselves previously unrecognized, because they had never thought of there being anyone different than themselves. We had the same experience in this country during the Cold War, because suddenly we found that there was a challenging social system on our planet that was giving us a real run for our money. It was, of course, military, but it was also scientific and ideological. And it was serious. That led us to a tremendous attempt to return to an evaluation of our goals and concerns and society.

This development led, during the Eisenhower Administration, to the appointment of the President's Commission on National Goals, which was another group of distinguished Americans. The Committee reported in a volume called **Goals for Americans**[5] in 1960. It is not a statistical publication at all, rather it concerns those things our society cares about. It's very ideological and it's very American, stressing the Constitution and the goal of individual freedom, the role of the individual in society and the conception of society as something made up of individuals rather than groups. A very individualistic and idealistic conception, and a very interesting document. Despite the public relations rhetoric it was intended to be a very serious statement about the American people. It did not spawn any significant action because it was not clear what to do about **Goals for Americans** except affirm the value of the individual in society and urge everyone to do his best.

It was followed by a more action-oriented volume, **Agenda for the Nation,**[6] the product of another distinguished group mobilized by the Brookings Institute as a guideline for the presidential transition of 1968. This is a very significant document because it tries to move these various goal areas into an action context, an agenda for possible actions in the near future. Also, the work strongly marks the transition from the Cold War psychology. Of course, the notion of national defense as an important goal was still very prominent in 1968, but **Agenda** doesn't contain the Cold War visions that dominated the 1960 volume. These two volumes fit very closely together and are both very goals oriented. They are about the image, the characteristics of society that the members of society might care to know or do something about.

Now the two trends have come together. The measurement trend has its two main outputs in the official **Social Indicators** volume and the **Comparative Urban Indicators**[7] volume which

[4] **Indicators of Social Change,** Eleanor Sheldon and W.E. Moore, ed., Russell Sage Foundation, 1968.

[5] **Goals For Americans,** Prentice-Hall, Englewood Cliffs, N.J., 1960.

[6] **Agenda For The Nation,** Brookings Institute, Washington, D.C., 1968.

[7] M. Flax, **Comparative Urban Indicators,** Urban Institute, Washington, D.C., 1972.

was published by the Urban Institute in Washington. The latter is an outstanding piece of work, particularly for those of you who are in local government. It is the first effort to bring the social indicators idea down to a micro-level geographically. The measurement trend ends there. There's nothing about goals at all. Rather, here are things we are going to measure, and here are the measurements.

Goals and Priorities

The goals trend continues with **Toward a Social Report,** the HEW volume, and to a set of Brookings' studies that have been published for the last 4 years, **Setting National Priorities.**[8] These are studies of the Federal budget. What the authors have done is take the base line of **Agenda for the Nation** and determine to what extent things in the Federal budget directly or indirectly relate to **Agenda.** Each year they examine the Federal budget in terms of these categories, the goals that they think society wants, and assess how the budget fulfills these various desires. It is essentially a public finance, public expenditure, public program analysis.

I want to explain why I don't want to talk in detail about the Brookings studies. The reason is that although the authors clearly say that this is not so, one would get the impression from looking at the Brookings studies that the principal way society accomplishes its goals and responds to its concerns is through the operations of the Federal Government. They don't mean that; they don't think that; but that's what these studies are about. These are studies showing the connection between the Federal budget and the broad areas of social concern. However, the rest of our society is very big and what the rest of society does, either on its own initiative or in response to various Federal activities, is extremely important. Other studies, while they may include aspects concerning the Federal Government, start and end with their focus on society. That is the viewpoint that I would like to emphasize and am interested in for my own work.

It is interesting that none of the Brookings studies are Government financed. They have been generated by other groups in society, although some of the people involved are, have been, or will be Government people. This is not a highly partisan effort. Many people feel that everything that is done at Brookings is the work of the shadow Democrat Cabinet that is waiting to go back across the street. There is some truth in that, but these studies are not partisan studies. They are not exclusively Democrat in perspective and they are not exclusively critical of the Republican Administration. They are intended as cooperative, constructive, analytical approaches and have been very influential. But they do focus on the role of the Federal Government and make it appear that everything depends on the Federal Government.

The newly established Congressional Budget Committee is more or less an outgrowth of these studies. Analysis of this type now can be undertaken by people in Congress who have some real authority to take action when their assessments indicate something should be done. This approach was initiated in the first Nixon economic report for 1970. The Council of Economic Advisers was chaired by Dr. Paul McCracken, and at the time Dr. Herbert Stein was a very important member. They put into the report the idea of "national economic priorities" and tried to make an analysis of the total GNP, not in terms of the usual investment, consumption, savings approach, but in terms of "use" categories, such as subsistence requirements, food, shelter, health, education, and national defense. They allocated the GNP among the priority uses on a statistical basis.

This was an idea that over the past two decades had grown out of the National Planning Association. Stein came from that organization and brought this idea into the Council of Economic Advisers. It is a very important idea. It looked like it was going to be the basis for a whole new breakthrough in the role of the Council of Economic Advisers, to get them off the GNP and on to something about what people really do in the world. Unfortunately, the combination of Vietnam, Watergate, international monetary problems, and inflation submerged that idea entirely and it has been abandoned. I hope this idea will not be totally lost. It was the most original idea to come into the economic reports since they began, and certainly the first original idea since 1962 when the "gap" between capacity output and actual output was introduced in the first Kennedy economic report.

Toward a Social Report

Let's turn now to the publication **Toward a Social Report.** It is out of print. This is an important publication for anyone with a real interest in the subject of social indicators because it's a milestone, the first Federal publication on the subject. Also, it is an outgrowth as much of a goals theme as of the measurement theme, officially tying the two together in a document coming from the Government, not just from private investigators. It was written principally by Mancur Olsen, a professor at the University of Maryland, and Alice Rivlin, who was the Assistant Secretary of HEW at that time, and who coauthored the Brookings studies previously mentioned.

The book's table of contents represents a very suggestive list of the concerns that were identified by this group of people. These are roughly the areas that you see in all the publications and studies that deal with social indicators.

Looking over the table of contents one sees each category is followed by a question. Under "Health and Illness" they ask, "Are we becoming healthier?" That is a question about factual indicators. We assume we know something about the goal. We have the idea that one interesting characteristic of society is whether people are healthy. Then, we immediately have the question: What do we know about how well we are achieving that goal? On the table of contents you have the conceptual point of tying the goal areas together with measurement techniques to develop a feeling for the state of society. That is the central social indicator notion.

The next goal area identified is "Social Mobility"—meaning primarily job opportunity and educational opportunity. To some extent you can always define social mobility in a negative sense as the absence of discrimination; the ability of people to move freely in society in response to their interest and abilities and the availability of avenues of movement like jobs and education to people throughout society. This is a very general idea and certainly a very hard one to measure, but you see how the measurement goes when they say "opportunity." You don't have to move off the farm; the question is whether you can move off the farm. You don't have to move out of the ghetto; the question is whether you can move out of the ghetto. Potential is really the

[8] **Setting National Priorities,** Charles Schultz, et al., Brookings Institute, Washington, D.C., 1971-1975.

question implied here. Potential is one of the most difficult measurement areas but it is a very important one.

Then we have the area of the "Physical Environment" which, of course, has since become, in many people's minds, the number one issue. However, it was not the number one issue at the time, although it was very prominent.

Then we have the traditional "Income" question going back to the GNP, the distribution of wealth, family income levels, and the poverty issue. With income we have a good example of how we shift the definition of our goals. It is not clear that higher income, or higher average income, is really the goal. It is a little different from that. It is adequate income, perhaps some kind of system-wide increase in income; and then we shift toward the question of income distribution and elimination of poverty. It's not clearly in anybody's interest for the richest "X" percent of the population to get richer. You might even find that rich people don't want that. Indeed, their behavior suggests it, because they give money to charity, which implies that the idea of yet being wealthier is not really a high priority goal to them personally. Nevertheless, the income element, and the poverty question at the bottom of the income element are certainly important social concerns.

Next is the "Public Order and Safety" question, which is of considerable interest to several people here. I'd like to refer you to that chapter because it's a very interesting discussion of the measurement problems as well as the transition into the attitude aspects which are so important. Do you feel safe rather than are you safe? I have not been mugged yet, but I thought I was going to be mugged; and I did not like that. Therefore, the potential dimension becomes significant, but in a way that is not quite the same as with respect to income or physical environment. For example, you want the air to feel clean, but from the health viewpoint, you really are more concerned with whether it is clean. So the fact really matters. But in the health and safety area there are a lot of factors concerning attitudes that might be as, or more, important than some of the outside facts themselves.

Then comes "Learning, Science and Art," which involves all types of education and research. Here we are at a point where we declare, "No! More is not better." That is, more years of education are not better. It is not our social goal to continually increase the number of years people spend in school. Many people believe we may have carried that too far already. That does not mean there won't be a need for additional education for certain exceptional people and tasks required by the needs of our society, but the notion of just perpetually increasing the years of schooling is obviously foolish. What we do not know is where to stop on that trend of development. Also, we do not know where to shift from the input element in education, where additional years of schooling are both socially and personally desirable because they will benefit the person in society, to the consumption element of education. Education as a consumption element exists when additional education becomes a consumer good because one likes it and one has chosen further education as one might choose sports, going to the movies, or buying a bigger house. Education becomes a consumption good.

The dual nature of education as a producer of human capital and a consumption good gives us a dilemma as to what our goal really is. On the input side, you can make a productivity analysis to determine what amount of education will "pay off" both socially and for the individual. That is, you want to make the individual more productive for himself and for society as a whole. But on the consumption side, the goal of education, like any other consumer good, is to provide adequate minimum opportunity for all. But there is no desire to have people consume more education, more food, or more water, just for the sake of doing it.

I think that education and research, the broad artistic-scientific-learning area, is one of the most difficult indicators to conceptualize. It is hard to develop a concept of what to get information about which will meet the criterion that if the number goes up things are getting better, if the number goes down things are getting worse. Identifying numbers that have that measurement characteristic and then getting the desired number is very, very difficult. So much of what appears superficially to be improvement, like more years of schooling, isn't. It can represent a decline in the productivity of education; the education may not be so good, and so it takes longer to learn the same amount. That's obviously not what you want.

It's the same problem with the hospital bed indicator. Is a hospital bed being full or being empty a sign of health? In a way, empty beds are a positive sign, because if there is nobody in the hospital they must be well. On the other hand, some kind of usage ratio is a very significant sign of the availability of a health facility to people who need it. Right there you have two entirely different interpretations of the occupancy statistics in our hospitals. The question is: How do we define and articulate goals and concerns in a way that allows us to see how we are doing?

One more point about the list of concern areas: "Participation and Alienation." "What do we need to learn?", is not the question that they really intend to ask, because it is asked all the way through. The question really is, "How much social cohesion is there?" Are people, in fact, involved in society; do people as individuals see themselves as having a viable role as members of the society instead of enemies, or alienated individuals within or outside it? The discussion in that chapter is very good, although the measurements are very difficult. They emphasize three themes: (1) Freedom, and that's a sense of freedom. This is very qualitative data, attitudinal data—whether you feel free in society. (2) Equality, again, a sense of equality. It's not a question about income, whether your income is higher or lower; it's, "Do you feel that you are in the middle or above or below vis-a-vis other people and not just in a dollar sense, but in the behavioral sense of the equality of your position, and community?" (3) There is the notion of Participation. Registration and voting behavior are very accessible statistics and most people think them relevant because they clearly relate to one's participation in society. If you're in society, be sure to vote. If you are not in society, don't vote. That seems to give a pretty good reading for an easy statistic on the cohesiveness area.

No one thinks that this is the complete list of the areas of concern and social goals and we agree it is very difficult to define the particular goal and its specific measures even in these areas. However, on the domestic scene, these prove to be pretty good catch-all areas, reorganizable in various ways for various purposes. By and large, you find some version of these areas being used in most of the subsequent social indicators work. In fact, you find the recent **Social Indicators** report substantially the same as the table of contents here, except for "participation and alienation" which was not covered there. It could have been, with voting behavior data, at least, and I imagine it will be included in some subsequent study.

Discovering Social Goals

A couple of things about this list. We can always raise the question of how such a list of goals is determined. There is the

related question of how are they discovered by the people trying to serve society by providing information about them. Those are two different questions. The "How is it determined?" question is very hard. You can say, "Well, it's determined by all the processes that take place in society. Teaching, home upbringing, social forces, catastrophies, leadership, and everthing else, go into determining a person's view about the way the world is."

At the theoretical end of the social indicators field, where considerable work is underway, people are trying to develop a conceptual model of society that will have some of these dimensions. You start with a theory about people, and then theorize about them interacting, which is, of course, society. Out of that theory about people and their interaction will come some performance dimensions which will be the areas of social concern. That is a very ambitious undertaking and some progress is being made.

I think that people at the action level, more like ourselves, do better just to accept the notion that there are some things that the members of society are interested in and some things that they are not. We would do better to shift, therefore, from the question of "How is it determined?" to the question of "How is it discovered?" If we are interested in fulfilling a role here, we would like to be able to observe for ourselves and to report to society information relevant to the areas that society is concerned about. Therefore, you shift out of this sort of theoretical notion and into an empirical notion of determining what it is people are concerned about. Very sophisticated techniques about this are available and should be used to find out what people desire.

A good example of the problem of determining what people want has to do with health, particularly the Government-supported health insurance question. As you know, this has been a subject of great discussion and experimentation for at least two decades in this country, and nowhere more so than in California. Throughout the 1960's the question was: How much do people really care about that? That is, what do they really want in the way of health care protection?

Many studies have been undertaken to determine that. Two studies that I have were undertaken at almost the same time. One was a so-called Delphi technique study, a "polling the experts" study seeking the views of the best-informed people. The other was simply a random sample of public opinion. Both were aimed at discovering very broad areas of social concern. They were conducted by The Conference Board, formerly the National Industrial Conference Board. Vietnam dominated both lists. Setting that and the international items aside, the two lists were very similar, which is reassuring. Both the experts and the random sample of the larger society indicated the same rankings and the same kind of priority list, with one exception—health. The experts just didn't see it! It didn't have any prominence on the experts' list, apparently because they come from a part of society in which that is not a pressing personal problem. The experts about society did not recognize how widespread the feeling favoring some kind of health care protection was. The random survey showed health care as the highest priority. Since then many polls and surveys have shown this public concern and Congress, by its behavior, has recognized it. President Ford, in his first address, said the one thing he wanted for certain was the establishment of this health care program. He's obviously trying to do what he thinks is at this time the appropriate thing for the needs of the country as expressed by the public. This whole story is a very good warning to all who work in this area and are apt to think that experts are aware of what society wants. You see, the experts didn't know; you have to ask the people.

Mr. Barabba: Let me carry that one step further because the period of your two surveys was a time when my former company, DMI, was doing research in this area. As I recall, Dick Wirthlin mentioned to the class the "Alias Smith and Jones" technique where, rather than identify the institution that held a point of view and then measure the public's attitude towards the institution, we put a hypothetical person in place of the institution. That, basically, was a concept designed for a study dealing with the measurement of public attitudes toward two national health insurance programs as envisioned by Senator Kennedy and the American Medical Association. You can all appreciate the differences that you would be measuring if you said the AMA feels this way and Senator Kennedy feels another. That's why we came up with the "Alias Smith and Jones" technique.

The example that I remember best was Montgomery County, Ohio, which is the Dayton area. It's an interesting, completely self-contained community. It tends to have a two to one Democrat registration and is very heavily unionized. We conducted a study there and before we gave the results to the local physicians, we gave them the questions and asked them how they believed the public would respond to the two views. The Montgomery County Medical Society, almost to a man, predicted the community would identify more with Mr. Smith (Senator Kennedy) than Mr. Jones. Yet it was just the opposite in the community! The community identified more with the American Medical Association, favoring less involvement in the program by the Federal Government and more participation by private insurance companies and medical societies.

The doctors did not believe the study. They argued that the study did not reflect what the newspaper headlines said—that society needs more and more of this. We found that we really had to convince the doctors by actually going through each step of the study to prove that it was a systematically drawn sample, and the procedure was as unbiased as possible.

We, then, duplicated that example with a leadership meeting of the American Medical Association where they had doctors from all over the country. We theorized an area like Montgomery County, asked them the same questions, and the exact same phenomenon took place. They saw the public as really being more against the American Medical Association than it actually measured to be, further indicating experts are not always aware of society's desires.

Student: In your Delphi approach, were your experts all physicians?

Dr. Preston: No. This was a nationwide social concerns approach. I don't know how many of them were physicians, but there wouldn't have been very many. This was an attempt to find out what the major areas of concern to society were perceived to be by a broad cross section of experts.

Student: I was wondering if your approach would be slanted by who you used as your experts?

Mr. Barabba: I think in any kind of a Delphi technique that's an inherent problem.

Dr. Preston: This is a very significant point. In designing this social indicators report it would be very easy for a group of people to sit down and decide what the major categories are, gather the appropriate statistics related to the categories and produce a beautiful, fully documented report. But if you gave it to the man on the street and said, "These are the areas that are of concern to society," he'd say, "They're not areas I'm concerned about." If one is really interested in developing material of this sort for social decisionmaking purposes, we'd like to get the man in the street's views into this process as early and accurately as possible. This will help the process generate the self-conscious image of our society that reflects those concerns of society.

There's a role for explanation and leadership in this process that is important. It's like the courts. When we have a real jury trial with the adversary positions and evidence presented, the aim is to get a consensus from the jury. The consensus of the jury is the judgement of guilt and innocence. In that same sense society determines its social goals.

Like the jury trial, there's a role for advocacy in presenting evidence—the reasons for a goal, the justifications, what it really means, the cost, the effect, and those types of things. You need to have all sides presented if you are going to get a consensus back that is worth anything, that is really accurate.

The whole social indicators' focus is on performance attributes. We ask: What is the output of the system? More than that, what is the characteristic of society that is related to the output of this system and how is that getting along? Not just having more people in the hospital beds, but actually more well people out on the street. That is health, and that's the thing you want to focus on.

I'd like to shift to the National Planning Association study, headed by Dr. Nestor Terleckyj. This study first identified areas contained in **Toward A Social Report** and other general literature, and one or more indicators to go with each area on a measurability basis. They only chose things on which they could get information believed reliable and not overlapping. Then, using the decade from 1972 to 1981, they tried to forecast the trend for each of these indicators within the defined goal areas. In other words, they took a goal area and anticipated simply from the way things are going; if no changes occur, the indicator will display some pattern of change over the future. Then, and this is the hard part, they go to the problem of estimating feasible changes from the trend. This involves a combination of technical and economic analysis. For example, "X" number of people have gone to the moon and if that trend continues for the next decade, "X" many more people would go there over that period. Then, on the basis of technological feasibility, it's theoretically possible the whole population could be sent to the moon. However, that is absurd. Conceivably we can send 2 dozen or 4 dozen persons at a certain cost within the realm of possibility, if we choose to do that. The alternative to the projected trend is the difference based on a technically and economically feasible program.

You have a range of choices between where you'll be if you don't do anything different and a sort of maximum conceivable change. They break the decade down into two periods because in so many of these things the timing is critical. You would have to do so much within the first 5 years if you were going to be able to do so much in the next 5 years.

They add one more dimension—and this is really a hard dimension—they ask what a program would cost. You take the same time chart, except you have cost instead of the indicator. What would it cost in terms of resources to achieve the estimate as opposed to other programs? What would it cost over what you would spend on that program otherwise? Again, in the cost you have a starting point, the cost which you are already experiencing; and you would anticipate some costs continuing into the future, no matter what. If you wanted to go up to the maximum possibility, what would the cost be then? They break that down into time periods, which is so important because the total cost implications will be very different depending on the timing factor. To get the total cost you have to take the cost per year for the whole decade and timing has a tremendous impact upon that.

You can imagine how difficult this work is and how many guesses, estimates, and adjustments are involved. The methodology is important because it represents a big step beyond existing social indicator work, by going on, first, to the trend projection, recognizing that the indicator can be expected to change over time merely as a result of society going on; then, estimating the maximum change; and, then, tying that to the cost and the timing. Those all are new conceptual additions, and very, very significant ones.

Another virtue of this approach is that it shows the interrelation of goals. You start with society as a whole, with all its characteristics which are interrelated. Then you begin to identify the goals, and that provides separation. Then you identify the indicators and that's very separate, because they have to be specific. Then you go on to the activities and policies, and, again, they are concrete; that is, whether an activity is going to be in HEW, at HUD, or the police department. Where is this activity going to take place? But the impacts, the results of those policies, are going to manifest themselves within the society at large. Therefore, the analysis helps you bring back the interconnection within the system, which is where you started and where you want to finish.

It's hard to end there when you go into increasingly particular types of items. We all know that the social programs of the 1960's embodied, as one of their characteristics, an attempt to have one program solve one problem. We had programs that were supposed to help correct one problem, and perhaps they did, but over in an adjacent problem area terrible consequences ensued. This NPA analysis is designed, for all of its shortcomings, to help you see these side effects. It's designed to bring out the interconnections, which one doesn't want to lose in any kind of comprehensive social analysis.

The other point about this type of analysis is that it gets you right up to the edge of trade-offs among the activities and, therefore, among the impacts. Terleckyj does not tell you which one of these to do. He goes into this cost analysis and then says: "If you add up all these costs and all the resources in society, these costs will outrun the resources; so you have some very difficult decisions to make." And that's the end of his presentation. He's not trying to decide for you because he doesn't consider that his role. I think that anybody with a political feeling for the notion of letting society make decisions for themselves would say that he's right. We want to know what we can decide, and then bring the decision itself back to the political process, back to public opinion and voting.

This is a type of input information for social decisionmaking. It says that you could have a maximum impact in this area with "X" dollars, or in another area for "Y" dollars. You may not have enough dollars to do both, or you may not want to use enough dollars to do both. You may not want to give up something else to get the dollars to do both. There is your choice. It includes the trade-off idea as well as the interrelatedness idea.

Interrelatedness means you can take one activity and have lots of different impacts. Trade-off means that with a number of different goals you may have to make a choice among activities, since you can't have them all. This way of thinking puts the key social trade-off problems into perspective, and permits one to think about them in output terms.

Student: But, Terleckyj's work is really only a first attempt?

Dr. Preston: Yes. It is very significant as a first attempt. No one would imagine that Terleckyj and his associates could really produce factual answers to these difficult questions on the first try. But the idea is extremely significant.

There's one other thing about it that I want to call your attention to. When Terleckyj talks about cost, he shows total cost figures, and these are the cost increase figures, not the cost of the activity in a budget sense. Costs are broken down, first, by time (which is the point I emphasized already), and, second, by public and private. He's emphasizing here that given the present structure of our society, which we anticipate to continue into the future, we would expect that all of these social endeavors would involve some combinations of public and private activity, and the appropriate combination has a lot to do with which of the activities are chosen. The size of the public sector is of critical importance and is partly determined by which of these activities are to be the social choices. If we choose activities that are in the public sector, like national defense, we won't expect to have a big private endeavor. If we choose other activities, they may all be private, or they may be a combination of public and private.

It's the structure of this analysis that's important, because this type of analysis can be carried to many particular areas—to particular localities, to important goal areas. This work represents a technique of conceptualizing the comprehensive impact of the way the public and private sectors do business. I think that it will not be too long, with the new budget committee and as a result of the Brookings study, before some of this framework finds its way into official documents and becomes part of the image, part of the way we perceive the system working. Remember, our perceptions have so much to do with the way the system really does work.

Student: The difficulty is getting consensus on the goals.

Dr. Preston: That's not quite so. If we go back to **Toward a Social Report**, the table of contents, I don't think there's much confusion about the general direction of desired development in our society. I think that we have a much stronger social consensus about goals than most people realize, and all we have to do is bring forward some concrete proposals in many of these areas. Health insurance is an example, where all we have to do is get a concrete proposal before the political decisionmaking system. We have to get the proposal out there to find out what the consensus is. We can't get the jury's consensus before it goes in the jury room and votes on the evidence presented. They may have a perfect consensus sitting there in the jury box, but we can't say.

Student: The problem would not be arriving at the goals. The problem would be correlating the goals with our free enterprise system. I think that's where the hold up will come.

Dr. Preston: That's great! That's the next step! I agree with you 100 percent! I think there's a very broad consensus about goals. But I think there's a lot of uncertainty, more than disagreement, about how to act to achieve the goals. We want health standards to be better. We want better access to economic and social opportunity. How will they be realized? It is not that we disagree about having it, rather, we don't know how best to accomplish our goals. Fortunately, we're wisely distrustful of any one solution. We are pretty sure there is not just one solution, so we need to look for systems that will allow us to experiment with many answers, and let different answers solve different problems.

It's like curing unemployment. The easy way to cure unemployment is to shoot the unemployed. That is an easily overlooked point. If it is really true that getting rid of unemployment is your number one goal, stand them up and shoot them. Of course, the alternative is to put them in the army and send them somewhere else to get shot, which has been used historically. There are lots of easy solutions but it turns out that we don't want those. Our problem is to see how to use a multiplicity of solutions. And that's where the problem is. Not the consensus about big goals. I think we are a strongly consensused society.

There was a consensus during the 1950's, the Eisenhower years, in our society. Then in the 1960's came a period of division. I think we're back in a period of consensus, but the substantive elements of the concensus are not the same as in the 1950's. We have new dimensions about which there is agreement. Now we are trying to articulate our actions and policies on the basis of this new consensus.

Student: If this is the framework for measuring these goals, then would it follow that you could take these as an aggregate and come up with an index for the quality of life?

Dr. Preston: I'm very distrustful of bunching together dissimilar elements. Dr. Jones talked about the Consumer Price Index. We want to know the cost of living and what we have is the CPI. The CPI is a fine statistic but it isn't the cost of living. We don't want to discontinue it because we're hung on it, it's part of the image, and we don't have anything to substitute for it. You can't beat something with nothing. But we need an alternative.

Let me give you another example of combining everything in an index. In the early 1960's, Professor Aaron Gordon, who is presently the President of the American Economic Association and a leading economist, with special interest in unemployment, was appointed by President Kennedy to review the unemployment statistics. There was a question about the accuracy and the appropriateness of the unemployment statistics, like there is about the CPI. He studied it, with a group, and within his committee he alone recommended the discontinuation of the global unemployment rate, that is, the national unemployment percentage figure that you see in the newspaper. He said that he thought that the global rate was a bad indicator, even though the components were fine. You weigh the components together and produce a global figure which could mean anything. It depends upon the age structure of the population, the flow of young people into the labor force, retirement rates, and several other variables, so that anything could be happening as to the true facts about unemployment yet there could be the same changes, or lack of change, in the national unemployment rate.

Professor Gordon tried militantly to get that unemployment rate eliminated, but the other economists and the bureaucracy wouldn't stand for it. It's like the fixation with the GNP. The bureaucracy had too much of its image tied to the national

unemployment rate; people had spent all this time lecturing the Congress about the importance of the unemployment rate. They said, "Oh, if you discontinue it the whole lesson will be ruined." So they didn't do it.

I don't care about that statistic particularly, but I agree with Gordon's basic idea, that you want to stay closer to reality, if you can, without getting a thousand indicators. That's too many indicators, but a hundred is not too many, and 10 per goal area is not too many. Not at this stage of knowledge. Ten per area is much better than one. But, the notion of putting it all together into an index of well-being is not something I would agree with.

You discussed with Dr. Jones the Measure of Economic Welfare (MEW)—changing the GNP into the MEW. He opposed that and I certainly do, too. The GNP is fine for what it is. If you need something else, you need something else, but don't try to change the GNP. You shouldn't put frosting on your steak because you like dessert; why not have both? They are two different things. I strongly favor disaggregation, keeping the indicators separate, and keeping the goal areas separate, so that you can view the effect of different policies.

Mr. Barabba: To give you an example, take the Wholesale Price Index. That number came out and people said, "There's going to be an economic disaster because it increased by such a large rate." When we look at its components we see that several reasonable actions have taken place, which increased the whole average for that particular quarter. Does the average affect the whole society in its economic well-being, or can we compensate or design a program for those areas that increase? What we hear about is that the Wholesale Price Index went up. What should be talked about is what components of the Wholesale Price Index went up.

Dr. Preston: You really can't make any interpretation of the increase in the total index without going to the components, which may well mean the components should be the object of any action.

Mr. Barabba: Today we hear that the unemployment rate is holding steady. It is, yet there's so much evidence of a tremendous amount of turmoil in our society, but we're not talking about that because we're so locked in on something called the unemployment rate.

Local Area Data

Dr. Preston: I want to make one more shift and focus on local areas: bringing down the social indicators analysis to cities, States, counties, metropolitan areas, or whatever the so-called small area is. Of course, a lot of them are not small at all. I want to emphasize this direction of development because this is the last item we need to cover before we go into the use of social indicators in corporate management, which, at the present time, is the area of major activity in the social indicators field as far as empirical work is concerned. The other would be the theoretical work that I talked about earlier; the development of a theory of society that would have performance attributes that could be measured by the indicators. The empirical side, which reached a high point in the publication of Federal data on social indicators, is now pushing out to study urban areas, States, and other types of subnational groupings.

The Urban Institute set out first to make a study of social indicators for Washington, D.C. In a preliminary document, they discovered, as always, that the data yield a number for something and you necessarily ask whether it is high or a low number. Since you have just one number, you don't know. You need a base for comparison, a base for interpretation. Therefore, they pushed into a time dimension saying, "We'll consider the trend. What has it been, what will it be?" That's an easy thing to do. They decided to consider intra-regional patterns, such as city/suburbs, which is one of the things frequently studied in these various preliminary reports. Some of the studies, like the one for Charlotte, N.C. has a black/white comparison, which is extremely relevant for many cities, in order to make a disparity analysis in that dimension. There are other dimensions that could be used.

In Washington they needed a larger framework of comparison so they took 18 cities. In order to work on an 18-city basis, they simplified their analysis to one indicator for each goal area. They could get by with one indicator per goal area, in part, because they had a rather large number of goal areas, as compared to some of the studies that have just a few very general areas and many indicators within them. They had a larger, more detailed list of quality categories and they had one indicator for each. That led them to generate a lot of tables that permitted the comparison of indicators for each area across this group of cities and composite rankings. They made most of their analysis in terms of rankings. It's a simple comparison, and it isn't totally wrong if you are a little careful about how "finely" you rank.

They focused primarily on Washington to see whether it was improving faster, at the same level, or deteriorating faster compared to the 18-city average. They looked to see whether it was high or low with respect to the 18-city average; they looked at the disparity measures. They constructed this basis for comparison by looking at the other places that they thought presented at least a relevant analogy to the Washington area. They present the raw data for the indicators and they present rankings for the indicators.

This document has set off a whole set of similar, related, types of studies in all of the metropolitan areas of the United States, in one form or another, under one sponsorship or another. I think this is extremely appropriate. The global aggregates, on a national basis, are significant as reference points, but that's all they are. The policy initiatives, improvements, and changes have got to be observed and carried out at local levels.

SOCIAL INDICATORS FOR CORPORATE MANAGEMENT

Lee Preston, School of Management, State University of New York at Buffalo

"If we are looking for a system that will enable the managerial units to continue to function through time, we need a system similar to market forecasting that will not simply produce a list of current goals and desires but rather new information about what people will want in the future."

Lee Preston

Dr. Preston: All corporate organizations, which are the managerial organizations in our society, are set up for some social purpose. They don't have rights, as humans do, to do whatever they please; and there's no reason that they should. The approach that we have historically taken, that corporations can do whatever they please within their charters, is fundamentally unsound; we are about to abandon that idea. I think that's a factual observation. The extent within our society of various kinds of regulations—for example, the requirement of cooperating with census studies, demanding even confidential data—is already a statement that society requires many corporate acts performed without any choice in the matter. Add that to the tax structure. In a situation where half of the formal corporate profits go towards taxes, who can say that there's any limit to the power of society over these entities? There really isn't, and I think we're realizing that now. Therefore, we're looking for the implications of that realization.

When I talk to business groups the title that I usually use with this material is "Socializing the Corporation." I intend that to be a title that will cause people to at least listen through the first few minutes to see what on earth this flaming radical is going to say. I find many people say, "Don't we already have socialism?" I have to answer, "No." But I think their question reflects an awareness of the fact that we are operating in a self-conscious society that is deliberately setting up numerous goals and systems for the achievement of a variety of social ends.

If for no other reason, I do not think that we have socialism because of the relative lack of centralization of decisionmaking. In spite of the tremendous role of the Federal Government, the truth is there are very few decisions within our society that are made and implemented at a centralized level. There are decisions made at the Federal Government level, and they have vast implications, but it's not like the Army. It's not a set of decisions made and then executed down the line through the rest of society. I presume we want to continue that unstructured method for ideological reasons and also, I believe, for efficiency, because centralized decisionmaking is very inefficient, because it involves so much standardization. Standardization means that the solutions don't fit the problems since problems by their very nature require flexibility.

In response to the comment this morning about the problem of integrating the private sector into this kind of social consciousness, I think we are groping for ways that will permit the private sector to maintain the kind of independence, initiative, and responsibility that has characterized it, while adding these new social concerns. To find these ways we are taking the same kind of ad hoc, pragmatic, "Let's try this, let's try that" approach that we typically employ in the private economy, and adding a response to many of these other areas about which society is clearly interested.

The alternative to that, of course, is regulation. We see a great deal of regulation and it is increasing. Some regulation is desirable or necessary if we find that we can't get people to do anything any other way. As people in the private sector or other organizational managers come to see themselves as operating in a social context rather than in terms of any single variable such as profits, we can expect them to be looking for managerial techniques that allow the integration of that social context into their management.

This is not really anything new. It's not as if for the first time it were being proposed that organizations have more than one goal. Organizations have always had more than one goal, and people who say that in the end it all comes down to profit are mistaken.

You say, "What about the market share?" Oh, well, it comes out of profit in market share. "What about growth?" Well, yes, growth. "What about the stability in the organization?"

Usually you can increase profits by discharging all the top executives, since they're all overpaid. The answer is that we have to maintain the continuity of the organization and, therefore, must have prizes to keep people working through the system. Don't we have air-conditioning even though there's no law requiring it? Then you have company recreational facilities, whatever they may be; the flashy annual report that has no connection with anything, but which is a very expensive undertaking; and the big new building that is a great landmark downtown. It will be years before the building turns a dime, though it establishes us as one of the leading firms in the community. Yet, some say that it all comes down to profits. I argue that it's the image. Firms really have images of themselves that are quite different from "it all comes down to profits," although most firms don't yet have a substitute ideology.

I see the corporate sector looking for a different way to perceive its role in the system, its diverse connections with society, rather than saying, "Well, our real religion is profits, but we just do all these other things as extras." Frankly, it looks like the extras are pretty big and profits not so big, and it seems they have a different religion than the critics say. I feel that this is a phenomenon well under way in the corporate system. That's what I call a socialization process. "Socializing the corporation" is not nationalizing the corporation. It is bringing the corporation, and its management, into an awareness of its existence in the social context rather than having it think of itself as primarily an economic entity with the primary task of profitability. This is not to say that the economic profit goal will be suppressed. It's there, but supplemented by all these other goals.

Mr. Barabba: Along these lines, in past ages of corporate concerns, you had cases where a firm dominated a community. They were actually criticized as patronizing the workers for providing, in a sense, welfare services. The Hershey Company in Pennsylvania was severely criticized for building a company town and a place where everything was provided. Corning Glass is a good example of a company that contributes significantly to the cultural well-being of the community. General Motors in Flint, Mich., provides the whole recreation program of that city. You do have tangible manifestations of a corporate social conscience.

Dr. Preston: Very definitely. The company towns present the whole spectrum. There were company towns that were simply idyllic. There are company towns, even today, that people will not leave in spite of promotions because they feel it's just a wonderful place to live with all these facilities provided. It's typically a smaller place where you have all the amenities of a large city because it's a profitable company town. Of course, the other extreme is the archetype of the company town where it is a huge sweatshop and everything is taken back before it is paid out.

An individual was telling me about a town where his company operated. Historically, the company had been very benevolent in a moral sense, and intentionally so. It was not a town that was fraught with difficulties; it was a very harmonious community. The company decided to try to withdraw as much as it could from the company town aspect. One of the main elements of that withdrawal was to sell off the houses so that the indigenous population would become homeowners. They would then be the residents of the town on an ownership basis. It would be an ongoing community without regard for the company. However, when the houses were sold the improvement in the residences, property, and the community involvement of people in the town was simply incredible! The company executives could not believe it! They had thought that everything was really in good shape. But, the ownership of the houses and the property in general changed the entire social atmosphere. Voting and community organization changed very dramatically, with much more participation. This indicates that there are some behavioral elements that you don't see in economic, statistical, or numerical ways, but are there to be observed nonetheless.

This corporate sector movement, this awareness, this socialization process, has been underway for at least a decade. The idea itself is really 20 years old, and it dates from a 1953 publication called **The Social Responsibilities of Businessmen.**[1] This publication had little or no impact because those were years of stability; at best it was viewed as a benign contribution.

The student and civil rights revolutions in the 1960's brought all this to a head. The previously self-satisfied corporate executives found themselves being bombed on their heads, first by people on the street and then by members of their own families. They realized that something was out of tune, and that they had to pay attention. There was a crisis response by all the large businesses in the United States, and I know that you observed this in your own environments, wherever you were at that time. Certainly here in California you observed it specifically with Bank of America.

A lot of those stories had a beginning, a middle, and an end. They appeared then to be ad hoc phenomena; but clearly they were not. They were diverse, and each one was a unique case. These incidents resulted in this very different view of the relationship between the large organization and its environment. This naturally raises questions about how the relationship is to be monitored and managed. How is the relationship to be understood by the managers, by those people who are responsible for controlling these organizations? It is absolutely ridiculous to think that they can just give away all the capital of the firm to good causes and then close up. They could do it if they wanted to and if they were so licensed, but that would not accomplish the tasks that the society has indicated it wants these organizations to perform. Society has indicated its desires by buying their products. Theoretically, if you don't want a firm in the market, then just don't buy its product and it will go away. There are some monopoly cases where we find it very difficult to stifle undesirable firms. Satisfying material desire is the function of the consumer goods firm and similarly in the public sector we have these organizations to provide health care, police service, water, electric lights, or banking services that are vital parts of the system.

On the other hand, it is quite clear that corporations affect people's lives, neighborhoods, incomes, and everything about the rest of society to greater or lesser degrees. If management is going to bring that awareness of these consequential effects of the primary activity into its process, the question is how to manage in this "social consequences" atmosphere instead of in the "balance sheet" atmosphere and without throwing away the balance sheet?

Criticisms of Social Involvement

The notion that corporations can solve all the problems of society is acknowledged as ridiculous. The criticisms from those I call the "Fundamentalists"—the people for whom Milton Friedman is the spokesman—are very valid as regards the hysterical crisis kind of "General Motors, save the country!" screaming. Briefly, he makes three points in his classic criticism of this whole approach. One of them is that the job of General Motors is to make cars, or to do whatever else it's supposed to do, and anything it does that causes it to be less efficient is a deviation from that function.

Now, that's true. However, the answer to that is that GM doesn't just make cars, it also employs people, affects neighborhoods, does this and this and this. Therefore, even though its reason for existence is to make cars, its consequences are these other impacts. It's not a question about whether you want these other impacts or not, they exist. A management that doesn't acknowledge these impacts, or that there are ways society wants them to behave, would be as ineffective as a management ignoring the things society wants in its cars. It's like shooting all the unemployed or discharging all the executives to save money.

The second fundamentalist point is the very serious question of competence. By what competence do these corporate managers know what would be good for society? They're not trained in that. There's nothing in the corporate management technique that gives them an idea about what would be socially beneficial. We have seen in the last decade quite a number of well-intentioned corporate ventures which were terrible. Others certainly caused less good than they might have because the people that tried to do it didn't know what to do.

That's true. If it's a function the business must perform you add competence in that function, just as you do in engineering, accounting, marketing, or whatever else it is you need in order to perform.

[1] Howard R. Bowen, **The Social Responsibilities of Businessmen**, Holt, New York, 1953.

The third issue is legitimacy. The Friedmanites say corporate activities affect society at large. But, these corporate officers are not officers of society at large, are not politically elected, are not answerable to the electorate and, therefore, they shouldn't make social decisions. However, they do anyway.

Student: Certainly a counterargument to Friedman is that corporate independence, the so-called sacredness of the corporate structure, is invalid for all the reasons you mentioned, because the corporation essentially survives within a legal framework that sanctions its activities.

The option is to either create through their own volition the activities to meet these multifaceted needs or to have them legally imposed. Legal imposition comes, in our society, with actions such as mandating pollution control devices for automobiles, when the corporate structure isn't responsive to a situation they ultimately affect. The juxtaposition, the interface that's created is much more immediate even if it's more delicate than the Friedmanites would argue. They say that the ultimate bottom line that should make the corporate individual move in a certain way is that it is economically no longer feasible, legally outlawed, or there is a definite societal-legal restraint on a certain type of activity. People are starting to say, "What you have to do is anticipate and respond to problems prior to reaching an impasse, because the sheer inertia of a large corporate empire is damaging to society."

Dr. Preston: The Friedman people talk about the rules of the game. Neil Chamberlain, who has become a Friedman in sheep's clothing, recently wrote in his book **The Limits of Corporate Responsibility:**[2] "Oh, yes, you play within the rules of the game, and that means the legal system and what you're authorized to do, but then within the rules of the game you just acquire profits." The question is: What are the rules of the game? How are the rules of the game determined? How are they changed? Do you want the rules of the game to be only a set of legal enactments that are enforceable by the police? That had not been the custom in the free market economy, where the rules of the game have always been much more. Indeed, the cost of a system of game rules which are regulations supported by sanctions is probably greater than society can bear.

After all, if we have the notion of a private sector structure doing the work of society, accompanied by regulators and controllers from the public sector certifying all the regulations are complied with, we will double the cost of running our society. In that case it would probably be better to put it all in the public sector. It wouldn't be so expensive.

Besides that, I feel that one of the things we are most eager to preserve in our large diverse society is the possibility of multiple and varied responses. That's a feature of the market system. Anybody can enter the market and offer to do something and if people like it, fine; and if not, it fails. We've got to keep that process going because our society is just too big and too diverse to rely on legislated, regulated uniformity throughout the system. We know from following the experience of other countries, such as the Soviet Union, that it simply doesn't work to run a big complex society in an authoritarian fashion. Authoritarian rules limit the flexibility of response available to deal with problems that arise throughout the system. If you accept that there has to be considerable discretion and flexibility, why not use the system that we have, that already includes that discretion and flexibility?

I think we're going to keep our market system. I don't see any demand for extensive collectivization, and even the tendencies that we see toward increased regulation are really matched by counter tendencies. Regulation is so conspicuous that we overlook shifts in the opposite direction, although there are many; the development of alternatives in education is one of them. The whole challenge to the monolithic structure of the educational system is one of the counter tendencies in our society.

Indicators for Corporate Performance

There's a tremendous emphasis everywhere on decentralization and the flexibility it permits. The question that I came to—and this is how I got into the whole subject of social indicators—is, "Suppose the managers of a corporation realize that they are 'socialized.' They know they are in society. They also realize that they cannot become a charitable organization because it would be silly and wouldn't do any good. They are aware that they cannot simply sit there and wait until people scream for this or that and then try to do something. What are they supposed to do?"

The people that have been thinking and writing about it from a favorable viewpoint have tended to answer that question with lists. They look out at society today and ask, "What is it that people want at the moment?" That is what some of these opinion surveys aim at. They are supposed to provide input to the corporate urban affairs officers and public affairs officers as to what the society around them wants.

I think that is right, but we need to go beyond that and develop a conception and a methodology that will enable people to handle that question as the answer to what changes society wants over time. If we are looking for a system that will enable the managerial units to continue to function through time, we need a system similar to market forecasting that will not simply produce a list of current goals and desires but, rather, new information about what people will want in the future. In looking for such a methodology that could feed the managerial structure, I offer the social indicators movement. I am now working to develop appropriate reporting analyses that will use the format, methodology, and ideas of the social indicators movement as adapted to the individual managerial unit.

Let us return to the conceptual picture before we go forward to the data. We visualize the corporate entity, or any other managerial organization, as having a primary function. It's a shoe factory, it's General Motors, or whatever. That is what it does in society. It would not exist if it did not do that. It's nature we call the primary involvement. Around that activity there are all these ancillary involvements that are in the secondary or consequential area. Beyond these secondary involvements is the rest of society. That's a very important point. There are areas of society that you don't touch, or don't touch in any significant way, and these are outside the purview of managerial responsibility.

If you are going to talk to managers about management they have to be able to discriminate between the items that are on their agenda and items that are not, because they cannot manage the whole world. As a citizen, I can take an interest in anything I want to, but as a manager of an organization, there

[2] Neil Chamberlain, **The Limits of Corporate Responsibility,** Basic Books, New York, 1973.

are things that are not on my docket. That doesn't mean that I cannot take some interest in them.

There are limits of managerial responsibility. Now, the question here is, "How do you organize this? How do you monitor this in order to get some feeling for what society wants you to do and what your effects are; what the goals and standards are in these areas?"

Basically, there are two kinds of approaches. One is called activity-based scanning, which means that the firm looks at its own penetration into the rest of society, whatever that may be, and says, "I'll follow out what I'm doing from my primary activity. For my primary activity I have to be located somewhere, and that means I'm in a neighborhood. I've got to learn what people want in order to understand my neighborhood impact. Regarding employment, I need to know what people want in such areas as health plans and pensions. I'll trace out my own activities as they touch the rest of society and find out what people say as I go."

The other approach is termed societal overview scanning. Here the firm, instead of starting with its own activities, begins with the rest of society and comes back to the firm. It goes out with opinion surveys and asks, "What is it that society wants? What is the larger society telling me about what units like mine should do?"

General Electric and AT&T are the two firms that pioneered this. AT&T, which never published the original and very early work that they did more than 10 years ago, has since stopped. Today, GE is the pioneer; it has institutionalized this societal overview scanning and brought it into its very top management levels. In the mid-1960's GE began with a large analysis of trends in modern society, and learned it was not caught up with what was happening. General Electric was lucky with respect to the revolutionary movements of the 1960's. They were not badly knocked about; not nearly as much as General Motors, for example, or many other companies. I think one reason was they had already started in this direction.

As a successful consumer products company GE must have in its operating procedures methods for understanding what the markets want at any moment in time.

That fact combined with the electrical conspiracy antitrust case—which was the worst thing that ever happened to General Electric in the public image sense—interacted to bring GE into a very high level of social awareness in the sense of understanding that they exist as an organization within the larger society. Therefore, what society is doing and what it wants and what changes are taking place there are very important. That is just like technological change in an industry. If you are not following that you will not be successful over time.

Student: With a corporation like General Electric, what you have said seems absolutely unavoidable for its survival because most of the society is its customers.

Dr. Preston: Don't fool yourself about it being unavoidable. General Motors avoided it for a long time. It avoided it saying, "Mr. Friedman is right," until finally the bombs were going off all around—the Environmental Protection Agency was marching and the Congress was voting against General Motors. Finally it got the message and GM had to start finding out what was going on outside of Detroit. Unfortunately some people still don't realize it.

Student: To the extent that corporations realize and accept their involvement on their own there is no need for government regulation.

Dr. Preston: Absolutely. Take the General Motors case. When GM realizes it is in the world after all, it can no longer only sell cars, and say that everything is swell and that it is just in business for money. What GM has done, in fact, is activity-based scanning. It has started an inside-the-firm analysis and published the results in a series of annual documents called, "GM's Contributions in Areas of Social Concern." These are quite good. GM holds conferences with its critics and gives them a chance to ask a lot of questions. That's the stage the company is in now and it represents a very sincere and serious response.

However, the difficulty about activity-based reporting is that it is ad hoc. Even a company like GM only follows out a few of its activities' implications for the rest of society and fails to focus on the total society surrounding it. It doesn't reach any kind of conclusion nor is there any basis for comparison.

There are other organizations that work in the area of comparisons between companies across industries. The Council of Economic Priorities, in particular, has zeroed in on a few industries and produced some excellent reports. One of the most famous reports, "Paper Profits," concerned the paper industry, and dealt primarily with pollution. After the publicity they did a followup on the paper industry and reported very substantial improvements in a number of companies. They also reported on female employment in the New York banks, a very controversial issue. They are now in court against a corporation to obtain data in order to check on cooperation with the Equal Employment Opportunities Act and related issues.

While there are people who have entered into this from the critical side, we must also look for ways by which managements can start internalizing on a regular basis. They have to generate some information for their decisionmaking purposes and then, as appropriate or desirable, report to the stockholders, the community, the complainers, or the employees. After all, these groups are important people and they are interested and affected by these various social involvement activities.

I was looking for a way to get firms away from the "aren't we good guys" syndrome. That is, companies will report how much they spent on pollution control equipment. But that doesn't tell you a thing about their actual performance in pollution control. Input is a measure of effort, and it's not insignificant, but it's not what we care about. No matter how much was spent, if it doesn't clean up the pollution it was a charade or it was just done to abide by the law, but it didn't accomplish what society wanted.

The social indicators framework has the virtue of comprehensiveness. You have a feeling of the whole of society out there and the question is, What aspects of that vast society do you influence? Of course, if you do not influence an area you don't have anything to say about it.

The social indicators approach is comprehensive. It has this strong emphasis on measurement rather than subjective rhetoric. It also has comparability among measurements.

If we are going to talk seriously with companies about integrating this social perspective into their management the key is social indicators. It offers a framework that would serve, first, to give the image or the perspective desired. Then, it permits that image to change as society changes. It allows you to get away from the list-of-current-crises approach and into a broader framework.

Student: How are companies handling the cost of developing these societal information systems?

Dr. Preston: One of the important things that this approach has going for it is that most of the necessary data are there already. Companies have not brought it together and sometimes they have not even looked at it themselves, but I think we want to emphasize the organization's use of its own existing information in this framework and for comparisons. Some of the indicator's areas have a lot of data, such as employment and job opportunities. Naturally, we have total data; male, female, black, white, a variety of breakdowns under that one indicator. Similarly, on earnings. You have earnings broken down in terms of averages, ranges, and pay scales by a number of appropriate categories. This is one of our most detailed categories. To determine how a company or other organization relates to the rest of society in its income and employment-generating function, look at data for the company and we look at comparable data for its industry, its community, or both.

One company, for instance, has the interesting problem of an aging work force. That has a lot of long-range managerial implications, many of which are social. For example, there's the question of the medical and pension implications, and the new hiring and training inferences raised by this aging work force. One thing they have come to see better through this process of analysis is that they are going to have to think about some of those implications very soon because a substantial part of their work force is moving into the 60-year age bracket and that's going to have a very important impact on the company. It is going to stretch all through the social involvement areas, because it affects unionization and the turnover rate. I don't think there will necessarily be productivity effects, but there are going to be effects all through the company because of this aging work force. Following that alone through this set of social concerns is a valuable management exercise.

Student: You mentioned how a corporation, via indicators, could grasp the tenor of its environment both socially and economically. How viable is it for the corporations, and what is the state of the art today, to use publicly available information, Census Bureau data or locally generated data and information? How much could they, and do they, use attitudinal surveys of employees and the local community?

Data and Reporting Systems

Dr. Preston: This is an excellent question. It gives me a chance to discuss the report by the First National Bank of Minneapolis. The First National Bank of Minneapolis is not a well-known pioneer in this area. However, they faced exactly this problem. They didn't know anything about the words "social indicators." This project was undertaken by a lawyer who took a job as a vice president of First National Bank of Minneapolis as their public involvement man. He was not content to be just the old fashioned type, "I'll be named to the Board of Directors of the Boy Scouts, and we'll give them $1,000." He asked the very question you asked. "What does the community want, and how can we know things about the community that will be relevant for us?" Without any background at all he set out to conduct a social indicators study for Minneapolis and St. Paul, and he did it.

The whole story takes 4 years. The first year after he was appointed they announced, in the annual report, the intention to launch into this sort of community survey and listed the areas that they were going to study. The second year, he did what he called the social and environmental audit. Parts of the data were obvious and not hard to obtain, for example, the amount of employment in the city. It was reference point data with some further breakdowns into subgroups. His report had job opportunities, income, health, public safety, housing, education, civic participation, environment (land, air, water), transportation, and culture, 10 areas in all.

He also wanted to make a Minneapolis/St. Paul and a city/suburbs comparison. In some areas he found that this was almost impossible. In the field of education he wanted performance indicators rather than budget figures. What he really wanted were standardized test scores, results, that are compiled throughout the educational system, which could give readings comparable among schools. Although public record, he simply could not get that and had to give up. He went to drop-out rates, as they are generally thought to be of some importance for social cohesion, and they reflect job opportunities. Also, it is indicative of the effectiveness of the educational system, since if the system were really effective people would stay in it until they were finished. If students are dropping out it is a sign that something is wrong. He almost had to go to court to get the data on the drop-outs from the school districts. Sometimes it's really less a matter of availability in the sense of the existence of information than releasability of the information from the people who have it.

He was very fortunate to be in Minneapolis-St. Paul because that is a fairly sophisticated area. It is an educated, well-managed community and they had already witnessed several studies. One was a poll on job attitudes, showing the percent of people dissatisfied with their jobs. Other polls reported people who thought they had access to adequate health care; who felt unsafe walking the streets at night; who were willing to have low income housing in their neighborhoods; who believed the suburban schools were superior to the city schools; and data on participation in the United Fund. He was able to gain access to several studies of an attitudinal nature. From this compilation of data and without any new data collection activity whatsoever he produced a very good community profile.

The next year, 1973, he took these same topics, but not the same indicators, connected them to the bank and asked how the bank's performance was related to these areas. For example, in the housing area, his questions had to do with the loan program of the bank. That was the consequential involvement, the way that the bank was connected with housing, not its own housing, but its impact on community housing. Certain items concerned employees, such as their wages. Involvement was analyzed, as with the employees' contribution to the United Fund, which was taken as a sign of community cohesion. They had some survey data about job satisfaction for the bank and for the community.

What he did next was to assemble these available data from inside. Again, as far as I know, no new study of anything inside the company was made. It was just a question of pulling out the things that were there and drawing them into this framework. He developed a priority ranking of issues for the community on the basis of a city/suburbs disparity. He adopted the principle that the elimination of this disparity would be desirable. Areas where there was great disparity between the city and the suburbs indicated needed work, and he used that as his priority ranking. By using the data he tried to indicate areas where he thought the

bank was making an optimum contribution, just maintaining the status quo, or having a detracting impact. He did not advise the bank how to answer the questions the report raised. What he wants to do now is what I am doing, which is to match the indicators so that you are comparing those for the bank directly with the ones for the community.

In our own work, we have been pleased with our progress. We have about 50 indicators, though they aren't all matched yet. We have some for the company, others only for the industrial community. We are in pretty good shape because we are using both the community and industry to develop a basis for comparison. For these terms we use rather flexible definitions. We may use industry group, which is a very general definition, if that is the best thing we can get. Or we may use a specific industry. We may even set up a two-firm comparison, if appropriate. With the community, sometimes we use U.S. data, if available and relevant, for life expectancy or similar items. In the product-quality consumer-concern area we employ information about law suits or consumer complaints. There may be data like that on some type of national basis or we may use the State, county, or city, depending on what appears relevant. The whole process is designed to enable the management of the company to see itself in this social context and to observe how its impact compares with what is going on in those areas where we believe society is interested in the results.

Let me give you one more example of what we find. I was determined to work with a manufacturing rather than a financial company because financial companies are too easy and their impact is too indirect. My example is a manufacturing company with real safety problems. Its manufacturing procedures are such that there are some tasks that are very difficult to make clean and safe. They have done a lot to improve the safety situation, but it is not by any means perfect nor is it a perfect environmental situation. We started talking about accident rates with the management and they responded that such information was very confidential. Everything we are doing for them is confidential. We're not releasing it to anyone without their approval, and we consider ourselves inside instead of outside. They have to report accidents to their insurance company and to the State. How confidential is all that? Also, as private citizens we could go to the State and sue, if necessary, to obtain some of this data. We finally got them to stop pretending about confidentiality. It turned out that they thought that their record might not be favorable.

Eventually, of course, we got the data and made comparisons with all manufacturing units in the same industry. Our company has an outstanding safety record. Perfect safety, of course, means no accidents. They don't have that. We don't know anybody that does. But in comparison to things that are relevant, their safety record is something they can brag about. There certainly is no reason to suppress the safety record. Yet, they didn't even know that, because they hadn't put their safety in perspective. I think that as they become more familiar with this way of looking at things they may overcome the feeling that people are going to find out something bad about them. Of course, sometimes you do find out something bad. We found out that one of their plants is under EPA sanctions for air pollution discharges, although they say they are working very hard to clean it up. I'm sure they are working hard to clean it up, but the fact of the matter is that out of "x" number of plants one is sanctioned while the rest are not. I feel that in the process of doing this kind of work you cause people to become more accustomed to acknowledging the whole truth. This is the same as with financial records where you don't simply report the sales for years they are good, but you report them every year.

As we move toward institutionalizing this type of approach, we'll overcome the feeling that characterized financial accounting 100 years ago. "No, we don't reveal our sales to anyone." You just couldn't run a modern business that way. We are at the stage where many things about the operating characteristics of a firm and its impacts on society are just not going to be secret anymore, because they're not really secret anyway. They're all filed somewhere and the facts are available if you go and get them. But the management is just coming to face this.

We have been hard-pressed to find comparison norms all the way along the line. Indeed, it is comparison norms that today are our biggest problem. I thought, when we started this project, that we could pretty well turn to public sources, particularly since Buffalo was covered by the Urban Institute Study. I thought we had a reasonably good profile on Buffalo right there. Plus, knowing how much census data are available on standard metropolitan statistical areas and central cities, I believed it would really be quite easy to generate at least the community comparisons. We have found that for this particular purpose—because we do want to have the indicators that match something for a micro-organization—we must attempt considerable refinement and we are working on a social indicators project for the Erie-Niagara SMSA which is specifically aimed at this use. Hopefully, we can encourage other companies to use it for their own analysis and to generate their own internal data.

I think that the application of these techniques to the university is very important, where the university itself is a large entity, because it has impacts on so many of these areas, like housing, for example. It has so many environmental impacts. It has employee impacts. All of these things are consequential to its primary educational-research function. This whole approach is applicable to any other kind of large multifunction organization. This whole approach may not be applicable to a hospital, let's say, or a health facility, unless it is very, very large in its community. That kind of unit can more appropriately focus on one or two areas that would be relevant for its operation and lots of other areas could justifiably be left blank.

The problem that has plagued even the most sincere and precise attempts at corporate social analysis is that companies are all different in the first place, they don't generate ways of looking across a group of companies. They're ad hoc. You do it this year and you don't do it next year.

I feel that the corporate sector, in particular, is looking for a technique, and it has got to be connected with a theory, with an image, with a concept of what a corporation is. They're looking for a technique that will embody a concept that they can adopt, apply, and change over time. There is a real need for this kind of approach and I think that the social indicators theme is a viable one for this purpose. Hence, I am interested in the development of the indicators and particularly in their development on the local area basis, because that is where a corporation operates. By and large, it doesn't have an impact on the whole society. They have most of their impact where they are located.

Student: Has the Minneapolis bank taken action on the vice president's study? How does he intend to use his information and are the uses of the information somehow implicit in the goals he established?

Dr. Preston: He says that this system they have developed has affected a few of their major policies, as in the housing mortgage area and in connection with transportation planning in Minneapolis. That is, it has affected what the bank as an entity would do, what stand it would take about changing the transportation system and things of that sort.

Student: It seems the answer to my question is that the goals which determine the selection of the indicators imply the ultimate usage. As an organizer, you have to know in advance what you want, why you want it, and where you feel your responsibilities lie.

Dr. Preston: No, I don't think you have to know the answer, but you have to know the character of the answer. The character of the answer is that you want to manage this organization in a way that is viable and hopefully as close to optimal as you can get in relation to the larger society. That includes producing goods economically and selling at a profit, too. I think that's amoral, it's neutral. But, I think it's a managerial error to exercise in the role of a manager one's own moral judgment when that differs from the larger society.

Student: What about maximizing certain values, don't you have to know what values you're after?

Dr. Preston: I really don't think that anybody operating in any complex multifunctioned activity maximizes anything. We're back to the image. I think maximization is the wrong image for management behavior. It's very important, within management, to see what it would take to maximize one thing and minimize another. However, I think that in conducting the total operations, whatever they are, you never maximize anything. There are multiple goals; there always are, there always have been; and what you do is to adopt a strategy that involves a combination of these goals, no one of which is ever maximized.

Student: Let's say health or quality of life?

Dr. Preston: You'll never maximize it. You can't maximize the quality of life because that has too many dimensions, so it's just not possible. The only way to maximize health is to climb into the intensive care unit and get all hooked up so that you'll be kept in perfect health at all times. That's like shooting the unemployed. You don't want to maximize health. You certainly would never go out on the street, you might get hit with something! And in Los Angeles, even breathing the air is dangerous.

I think that the impact on management thinking of the economic notion of maximization has been bad. On management practice it has been good, but on management thinking it has been bad. It keeps people from understanding what they are, in fact, doing. They are not, in fact, maximizing. It's a mistake to think of maximizing things when you're not.

Student: What you're really saying is that it's better to intelligently allocate your resources than abdicate that allocation. You can make good or bad judgments, but you should make intelligent judgments, whether they're good or bad.

Dr. Preston: You try to do the best you can. But to move toward the kinds of judgments that will be successful you need to understand the organization as an element in society, an organization in the social context. It's not a question of whether they'll be morally good or not. It's a question of whether they will be successful. Successful means not having riots, not having your plant burned down; but it also means having people buy your product and your people come to work. If an organization does not have those characteristics it is not successful.

The Choice of Methodology In Social Problem Solving

Harold Nisselson, Chief Mathematical and Statistical Advisor,
U.S. Bureau of the Census

"I don't mean to say we need a model of the whole world before we can do anything; but every once in awhile you have to lift yourself above the trees and see how your measure of effectiveness is related to the total objectives by asking what you are really trying to accomplish with the program."

Harold Nisselson

Mr. Nisselson: To set some context and scope to this morning's seminar I have taken the approach that the people in the graduate school of public administration are present or prospective city managers, or people with the responsibility for operations and problem solving. My purpose is to talk about the general design of analytic systems for social and economic problem solving.

I want to cover quantitative and other methods which are objective and provide measures of uncertainty, or at least measures of sensitivity, to the assumptions made within and the results of the analysis. I exclude subjective methodologies and, particularly, argument by counterintuition, as well as any problems of national accounts or models of the economy.

The problem that typically faces decisionmakers in the context of social and economic problem solving is the allocation of resources between competing demands or alternative investment opportunities. Decisionmakers need to know how much of what kind of benefits or outputs can be bought for a given target group and at what cost. I believe that systems analysis is a useful tool for this purpose, because it provides estimates for the alternatives and a basis for analysis of cost-effectiveness. The classical paradigm of hypothesis testing is less applicable to the problems of decisionmakers because it does not. Given that a statistical test shows one alternative to be better than another, the question still remains: How much better, and at what cost? In my opinion, the questions really pose problems of estimation, not tests of statistical significance.

First, a system is a set of interrelated elements and some transfer functions which relate the inputs of elements to their outputs. These elements are all related in trying to accomplish some objective of the system. For analysis purposes we need to know how much input to an element leads to how much output, in going from one element to another and at the end. That, of course, is the ideal situation. Frequently we will fail to achieve the ideal, and quite often the best we can do is approximate it.

What we want to do is to talk about the general paradigm that allows the recognition or identification of a problem in relation to an objective. The term "system analysis" encompasses this approach. Somehow we become aware of the fact that a problem exists. Awareness is achieved by events ranging from the burning down of a city, or complaints to an agency, to just becoming aware of the fact that some work isn't getting done.

To carry out a system analysis we need a specification of the system's objectives, requirements, or desired outputs. We need to know what constraints may affect the system or solutions. Some solutions may not be politically acceptable, some may not be feasible for one reason or another, while others may be cost prohibitive.

With an awareness of these points we design some alternative solutions to achieve the desired output or end result and establish criteria for evaluating the alternatives.

Then, there is experimentation with the alternatives and analysis of the results. One alternative, typically, will be to maintain the present system, since it is always possible that a new system will make things worse.

As I have said before, the analysis is intended to lead to the ideal solution. Because the ideal can't be achieved, the most practical solution must be chosen.

Student: Could you give an example of a transfer function?

Mr. Nisselson: The simple type that many of us deal with is how much lawn grass is grown for how much fertilizer applied. There are relationships that tell you how much fertilizer to use per square foot, and you have a model for the lawn, length times the width to get the area. But, because the lawn is really rough, the area is only an approximation. Generally we understand these transfer functions in the physical sciences a lot better than those in the social sciences. For example, we don't know how much training input to unemployed or unemployable persons will result in how much employment.

The analysis compares the alternative solutions with regard to the measure of effectiveness. Frequently, the case is that there are multiple objectives, and then trade-off analysis is required to compare the compromises that are attainable with regard to each objective.

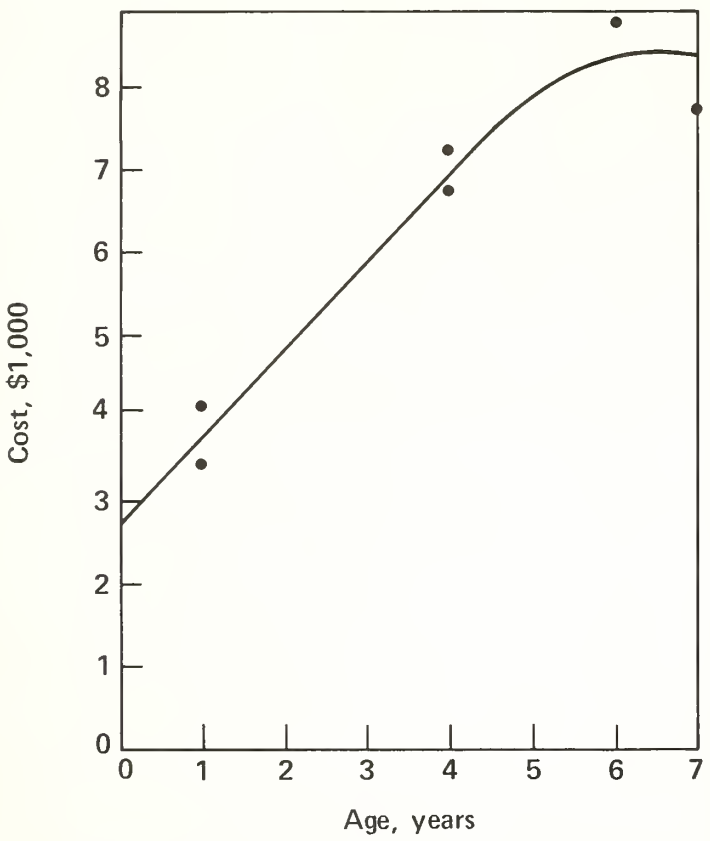
The following example illustrates in a more formal way the kind of analysis that we do intuitively. This one deals with refuse collection in a city of about 100,000 population.

The refuse is picked up weekly on a regular schedule. The refuse crew consists of a driver and additional men who pick up the trash and set it on the street, someone dumps the trash into the truck, and one or two men replace the trash cans. When the truck is full, it drives to the incinerator and returns. When they finish the day's assignment the truck makes a last trip to the incinerator, and the other people go home.

Some of the questions for analysis are: What kind of truck is required? Should you consider mainly the matter of the size or the capacity of the truck? What should be the size of the crew, how many people should you have on the different operations, how many people altogether? What is the design of the route, what kind of shape should it have, what kind of coverage, what kind of mix or kinds of houses? How should the routes be scheduled? What is the maintenance and replacement policy for equipment, which is essentially when should you replace trucks? Then, you could consider system alternatives.

The analysis that's illustrated here deals with the truck replacement policy, and it's very much like the analysis that you go through when you consider trading in a car. On the one hand, the longer you keep a car the lower the depreciation is, and so you're amortizing your initial investment. On the other hand, the longer you keep a car the more repairs you have to make on it.

Figure 1. ANNUAL OPERATING COST VS. AGE FOR REFUSE TRUCKS



Repair costs are reflected in figure 1 which shows a rough plot of the annual operating cost against the age of this type of truck. This increasing cost is a reflection of the fact shown on figure 2 that the probability of a breakdown keeps increasing with age. Finally, if you plot the days of use you get out of a truck per year compared to the age, you see that the usage of a truck goes down. There was some consideration of what the measure of effectiveness should be, and the one chosen was not annual cost but cost per day of use. That's plotted in figure 3. This shows a typical shape, as the cost per day of use declines to a minimum and then goes up again.

Basically, there's only one way to evaluate a program design and that is by running some controlled experiments to compare it with the alternatives or with the absence of a program. These experiments can be very expensive and time consuming, so it is exceedingly useful to be able to approximate the results of experiments with paper and pencil analysis. And in cases where the paper and pencil analysis isn't a complete representation or doesn't appear to be the final answer, and you still want to have a real life test, the analytic results can be used to help guide the type and design of the field experiment to make the process more efficient. For example, the results could be used to eliminate designs not even worth testing.

Figure 2. PROBABILITY OF BREAKDOWN VS. AGE FOR REFUSE TRUCKS

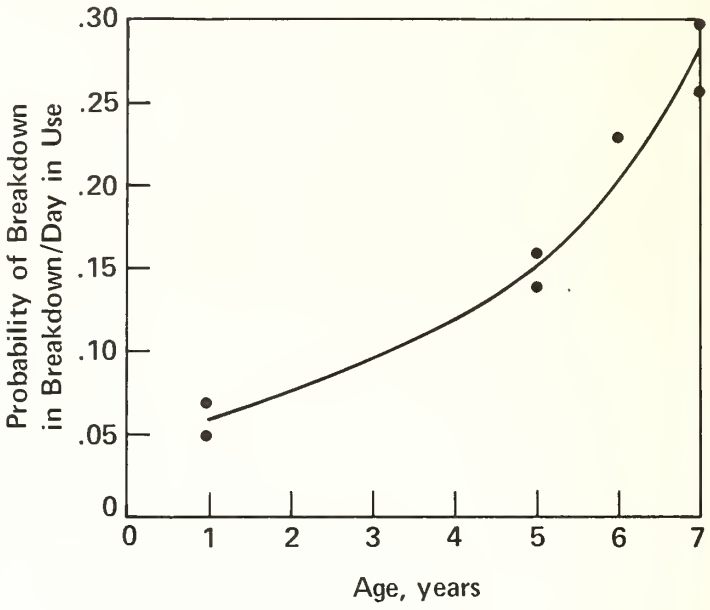
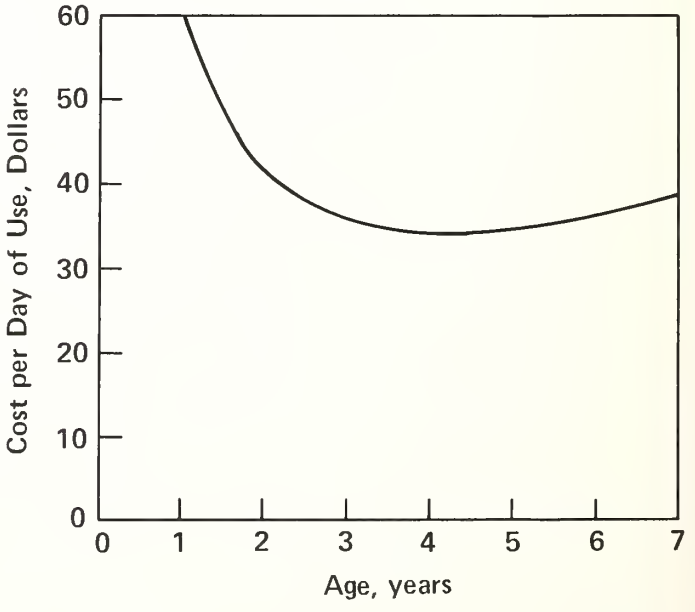


Figure 3. COST PER DAY OF USE VS. AGE FOR REFUSE TRUCKS



To carry out this sort of analysis we need a mathematical model, a set of equations or relationships and factors which abstracts the essential features of the real world system to a satisfactory degree of approximation.

In simple cases, an explicit mathematical expression for the solution can be obtained. However, when the analysis becomes too complex, a computer is employed to project all the possibilities and record the results. This is referred to as a simulation model.

Some idea of the power of such a method is shown by the observation that several years of operation of the health care

clinic we will talk about could be simulated in about 4 to 10 minutes of computer time, depending on the type of computer. And, this is a powerful savings.

I might say that the design of simulation models is a speciality all of its own. You may have run across references to it in war games, analysis of big weapon systems, and tactics. A lot of the developments came from military applications.

Mr. Barabba: A valid criticism about models is that on the one hand they are used to manipulate and analyze data more efficiently and effectively and with less bias than a person could. But, a point can be reached where the data is bad or the theory behind the data selection is not understood, and rather than stopping there, the model builder works around the bad data and goes on to the end result. When this is done there is a need for criticism.

What model builders should do when they reach an obscure point is to stop and say, "This is how far we've come. Here's all the information available. Now, let's have the decisionmaker select the next data element on the basis of experience, knowledge, and his understanding of the problem." The decisionmaker may be wrong in his selection, but at least he is aware of exactly what input resolved the difficulty.

Mr. Nisselson: That's a very, very important observation. I would be very suspicious of someone who couldn't explain the logic of what he was doing.

Mr. Barabba: Models cause us to think systematically. They're really an asset. I recall that we were asked to design a political voter behavior model, and to do this we brought in political campaign managers from all over the country but not one political scientist. We asked them, "What do you look for when you have to make a decision?" What kind of decisions do you have to make?" It ended up that most of the items needed to make a good political decision were available, either from survey research or records of past voting behavior.

And for the other items where you didn't have information we asked, "What's the concensus of the group?" The people for whom we designed the model were very comfortable with this procedure as they knew the group from which the concensus was drawn, and that group had either won elections or been involved in good decisionmaking. The model we developed ended up as a very, very accurate predictor of activity.

Even more important is to say, "What if?" That's really the key here because that's when you really find yourself with a valuable piece of information. You're going into a situation and you have a couple of alternatives and you say, "What if it was this? What if it was that?" Once you have the answer to that question with a degree of confidence around it, you've really made a major contribution to a decision. The systematic description of the phenomenon that takes place is a requirement of a good model. In other words, it forces you to plan and to think systematically. I think some of the better models don't go through the computers.

Student: It appears to me that the model designers might be prejudiced to what data are available in order to make their model work.

Mr. Nisselson: That's a troublesome question. There's no sense developing a model for which you can't find data to use. Sometimes people fall back on what they call sensitivity analysis. They say, well, I'll invent some data and see which are the most sensitive factors. On the other hand, one advantage of a good model, if you really understand the system and have the right variables, is that it tells you what information to collect. If you just go around scooping up data that are around you may get variables that aren't very meaningful or very useful. In a systems analysis study you will frequently find yourself going out to collect special data that you need.

A crucial point in comprehensive systems analysis is the choice of the measure of effectiveness.

For example, we could analyze a library system and its efficient operation. But if we fail to evaluate it in terms of the life or the social problems of the community and the community's objectives, we fail to have a systems view of a library in the best sense.

That was the observation that Professor Preston was making yesterday when he was objecting to maximization. He was saying that the measures of effectiveness, if they're badly chosen, merely talk about the efficiency of a single system and don't have anything to do with what you're trying to do in the community. If you can somehow find those connections between the system and the community, however you define "community," and relate them to the kind of community you're trying to build, or the problems that you're trying to solve, then you'll have a much, much more effective kind of analysis.

For example, in a probation or parole system, you can make the system look very good by just not allowing any risky cases to be paroled, and thus there is less recidivism; you never have people breaking parole. Except, that isn't necessarily what you want to do.

In a manpower training system a commonly accepted measure of the effectiveness of the system is the number of people placed in jobs. Well, the fact of the matter is that most manpower programs deal with very few people in the labor force. The programs have been criticized for placing participants and displacing workers not enrolled in these programs. Unless you've done something to create more job opportunities, maybe all you've done is just push the vacancies around, this measure that you're so proud of doesn't really measure anything.

Mr. Barabba: However, it is important that you not confuse the measure of effectiveness. For example, a congressman critically points out all the defaulted FHA government-subsidized mortgages. That's to be expected, because that is part of what the program is supposed to do. It's supposed to take credit risks and give them an opportunity to have a home. If there were no FHA mortgage defaults that would mean the program was probably dealing with the people who are not credit risks, rather than those it was created to assist. If it deals with the safe market, it has taken over a segment of the market place that the private sector could have dealt with.

Mr. Nisselson: It's particularly important to continually monitor the system because people within the system often pervert the measures of effectiveness.

Analysis of police operation are like that. If you measure efficiency by how many arrests are made, they'll make arrests. If you measure convictions, a way is found around that. Things are made to look less serious; grand larceny is downgraded to petty larceny. Or, people are persuaded not to file complaints. It is necessary to run quality control checks on the records to make sure the measures and systems are not being perverted.

I don't mean to say we need a model of the whole world before we can do anything; but every once in awhile you have to lift yourself above the trees and see how your measure of effectiveness is related to the total objectives by asking what you are really trying to accomplish with the program.

This next example illustrates a different kind of a point. The analysis was developed in connection with a North Carolina comprehensive maternal infant health care program centered in three counties. Presumably, however, with some appropriate modifications this method would be generally useful as a tool for analyzing maternal and infant care programs anywhere.

In this case, the authors were very conscious of the fact that there was a need to test the results of the model with some actual experience. The model was developed over 2 years and tested by comparing what the model said was going to happen with the actual results for the following year.

The analysis report states, "In general, the model produces an acceptable fit for the Wayne and Halifax County operations. The Warren County data does not indicate a good fit." Now they began to look at why this was. And, when things don't work, looking at why they don't work is a very informative process to go through. In discussions, the project personnel said, "Well, somehow it's different from the others." There was a different feeling about the operation, a different attitude towards the clinic, maybe people took it more into their lives and used it more. Their conclusion was that there was an extra variable which was not included in the model, and if you wanted to improve it you'd have to do further studies. The fact of the matter is that models like this have been further developed and explored, and they have been used in planning maternal and infant care clinics.

All of this ties in with the Census Bureau. In analysis there are all kinds of numbers that you need. You say, "Where do they come from?" They come from basic population data, they come from the Census Bureau. Some may come from special surveys, while some of them are generated by administrative records for operations of the county system.

You could get things like fetal deaths, for example, out of the vital statistics system. You get the denominator, that is, the number of births of which there was a risk of fetal death by the records of deliveries made in hospitals. Fortunately, in that case, we find that a very high percentage of births are in hospitals—about 99 percent of registered births take place in hospitals—so that provides a good base.

One thing you find is that the great need in all of these things and especially in the case of social indicators is to find appropriate denominators for the numerators that are generated by administrative record systems.

Reverting to the example, this analysis is intended to represent an idealized view of the real world as shown in figure 4.

Figure 4. **THE GENERALIZED MIC PROJECT HEALTH SERVICE SYSTEM**

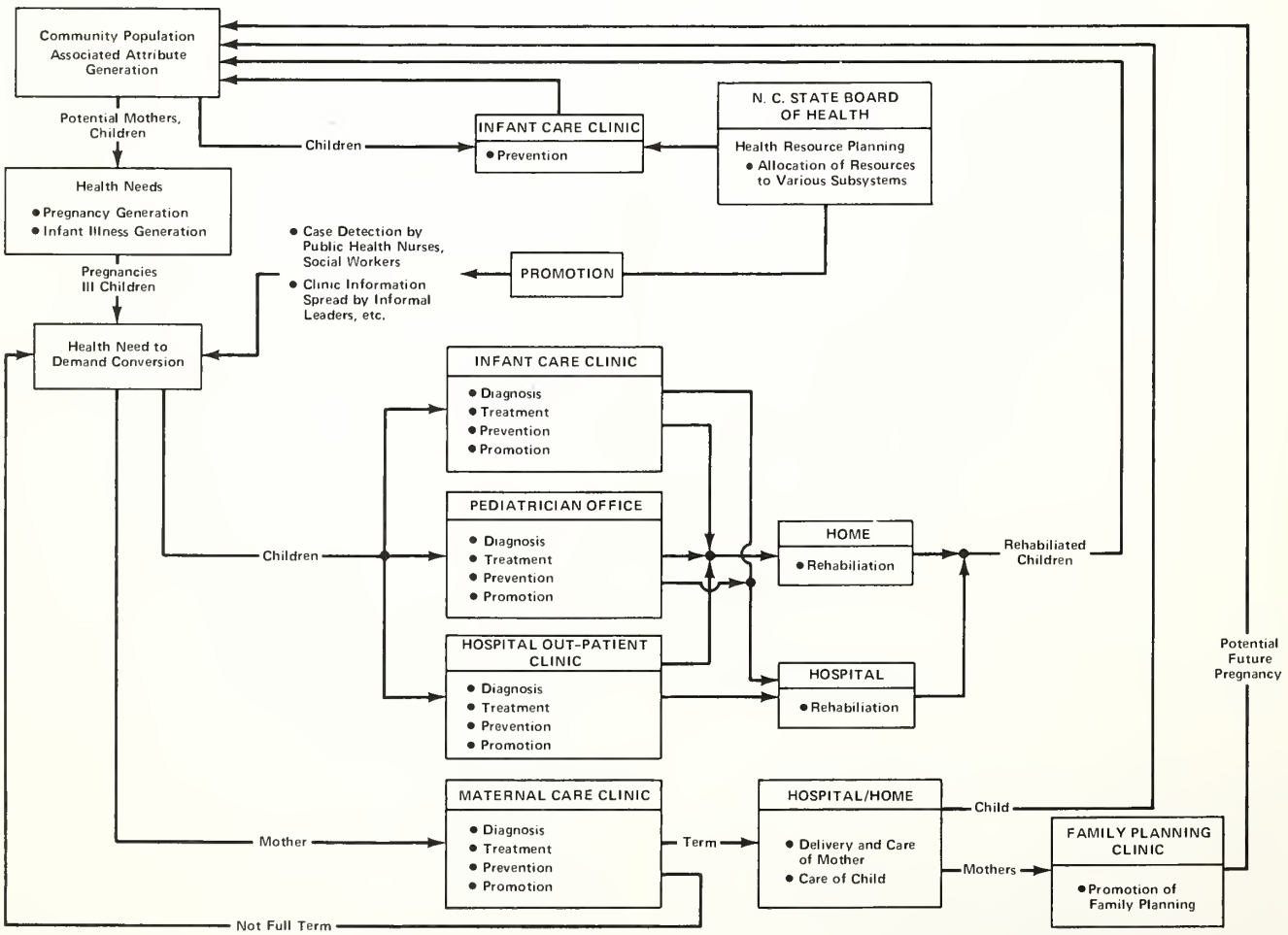
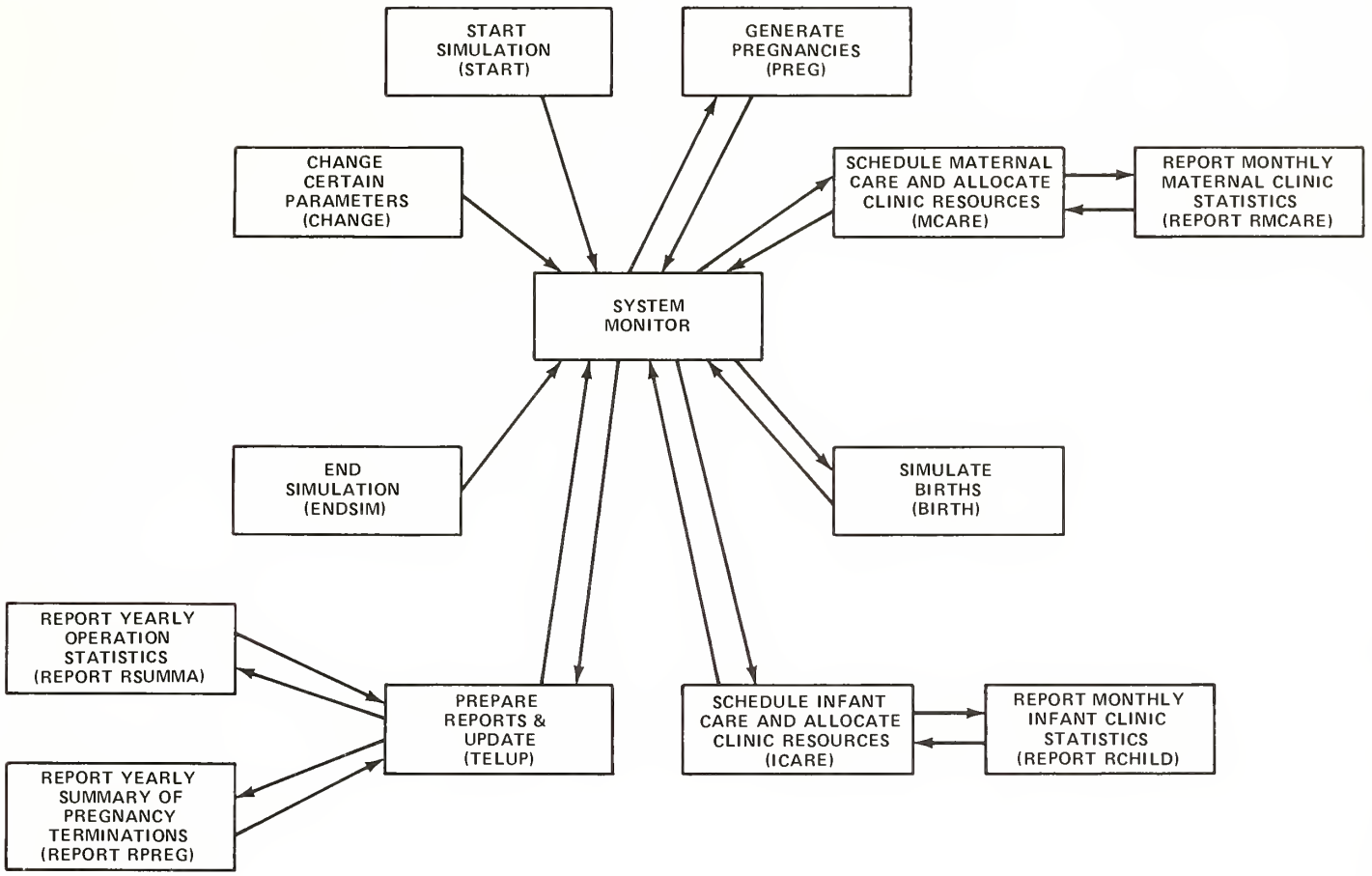


Figure 5. **INTERRELATIONSHIPS OF MODEL ROUTINES**


START SIMULATION (START)
GENERATE PREGNANCIES (PREG)
CHANGE CERTAIN PARAMETERS (CHANGE)
SCHEDULE MATERNAL CARE AND ALLOCATE CLINIC RESOURCES (MCARE)
REPORT MONTHLY MATERNAL CLINIC STATISTICS (REPORT RMCARE)
SYSTEM MONITOR
END SIMULATION (ENDSIM)
SIMULATE BIRTHS (BIRTH)
REPORT YEARLY OPERATION STATISTICS (REPORT RSUMMA)
PREPARE REPORTS & UPDATE (TELUP)
SCHEDULE INFANT CARE AND ALLOCATE CLINIC RESOURCES (ICARE)
REPORT MONTHLY INFANT CLINIC STATISTICS (REPORT RCHILD)
REPORT YEARLY SUMMARY OF PREGNANCY TERMINATIONS (REPORT RPREG)

It's pretty clear how you start out through the boxes. There's a community population in the upper left-hand corner and there are some associated attributes generated.

If you take mothers by marital status, age, sex, race, etc., you have pregnancy rates formed so you can generate events (i.e., pregnancies) and determine whether the pregnant woman uses the clinic. Given all those circumstances you have factors or equations that tell you how much stillbirth you'll have, how much fetal death, and after a child is born, how much infant illness. You can go through all these boxes from one to the other and, cycling through, you can see how the analysis works. The analysis logic, the way we're going to analyze this abstraction, is shown in figure 5. A summary of the model operations is given in table 1.

A system monitor keeps track of everything that's happening. You start the simulation which gets the monitor going, and generate pregnancies. Then you can schedule maternal care and allocate the clinical resources. Births are simulated, infant care schedules and so on. You go through all of the steps in the analysis and keep track of what happens.

The four measures of effectiveness considered are given as follows:

1) The maternal clinic attendance ratio: the number of scheduled visits divided by the number of actual visits. Normally an attendance ratio is expressed as "actual divided by scheduled"; however, in order to make all effectiveness measures indicate improvement as they become smaller in size, this inverse of a normal ratio was adopted.
2) Total personnel utilization ratio: the ratio of total hours utilized divided by hours allocated. When greater than one, this ratio indicates overutilization and, thereby, poor attitudes on the part of clinic patients (since they are receiving less attention than when the ratio is less than one). However, as the ratio becomes smaller than one, it indicates an increased cost per patient treated.
3) Abnormality ratio: the ratio of project abnormalities divided by project population, to population abnormality divided by the total population. Population abnormality was based on the area as a whole.
4) Infant illness ratio: the number of project infant illnesses as a percent of total project infant patients divided by the equivalent population illness ratio for the area as a whole.

Two of them dealt with clinic operations and the last two dealt with health outcomes; one of them being birth abnormalities which are miscarriages or fetal deaths and the other one, infant illnesses.

Typical results, outputs, that this analysis would provide are shown in the tables in figure 6, which summarizes the first

three effectiveness measures for a year's operation of the program, and figure 7, which summarizes the statistics on the outcomes of pregnancies. Other outputs from the simulation show details of utilization and costs of clinic staff by type—physician, nurse, social worker, and so on. An example of a comparison is shown in figure 7 where you see that, for the community as a whole, miscarriages and fetal deaths are running about 9.2 percent and for program patients they were running about 3.3 percent. The program, as it was run according to those parameters, was a great success.

Table 1. DESCRIPTION OF MODEL OPERATIONS

MODEL IMPUTS	SIMULATION OF THE MATERNAL AND INFANT CARE PROGRAM	MODEL OUTPUTS
Population Class Characteristics including size and crude pregnancy rate. Characteristics of the Pregnancy including, for each class, age distribution for mother, marital status distribution, parity distribution, and pregnancy outcome distribution. Initial Visit Distribution indicating during which month of pregnancy the mother attends the clinic for the first time. Economic and Educational Distribution for mothers attending the clinic. Resource List The personnel resources used in the maternal and infant care clinics in addition to the pediatrician office resources. Hospital-Stay Distribution for both mother and child at the time of delivery. Cost Data for the clinic and hospital operation Infant Illness Data based on project experience including illness outcome, where treated, and conditional probability of having subsequent illness.	The Model: Calculates the number of pregnancies generated in a particular month and assigns characteristics to them. Builds a schedule of clinic visits for the mother. Allocates resources for these visits and Records their utilization and costs. Creates a record for each pregnancy that terminates in a live birth and assigns appropriate characteristics to this infant's record. Generates an illness pattern for the infant and Builds a schedule of both clinic and office visits by the mother and infant. Allocates resources for these visits and Records resource utilization and costs.	Maternal Clinic Utilization Report for each month which indicates case load, amount of resources used, maximum clinic running time, and cost of clinic operation. Infant Clinic Utilization Report which is similar to the Maternal Clinic Utilization report. Data for the infant clinic, the hospital and pediatrician office visits are reported. Yearly Summary Report summarizes the clinic operations for the year and includes effectiveness measures. Pregnancy Termination Report a yearly report which indicates the number of pregnancies that terminate during the year and their outcome, both for the target population and for the population at large.

Student: Is this the way you would present it to the administrators, the decisionmakers?

Mr. Nisselson: You would actually go through some trial and error showing them different ways of looking at it. You'd probably have had enough discussion and have some know-how before hand. You'd know something about what people were looking at and what they ought to look at. It's a continuing process of finding out how to communicate with your boss. How do you present things to your boss in a way that they'll hit him right? If you get a new boss, you have to find out how he likes to have things served up to him.

The next example, opening Washington National Airport to jet traffic, is an interesting one because it illustrates how the results of analysis are used and fed into a political process. You may not know that Washington is served by three airports. There's Washington National Airport, which is very close and convenient to downtown Washington. Then there's Friendship International Airport which is about 35 miles away in Maryland, and Dulles International Airport which is about the same distance away in Virginia.

With the coming of jet aircraft there was a great deal of pressure on the Federal Aviation Agency which operated National Airport to open it to jet traffic. The argument was from those travelers who wanted the increased speed of jets with the convenience of the downtown airport. Because some of the travelers were also congressmen, it had great force.

Furthermore, the future equipment plans of the airline operators who were serving Washington showed that in a couple of cases, if National Airport wasn't open to jets they were just going to quit serving it. They weren't going to have suitable equipment. In some other cases, they might have continued service with piston and turbo-prop aircraft but at a reduced level.

On the other hand, both Friendship and Dulles were built to accept unrestricted jet traffic, both were large airports, designed with the idea that there was going to be a big increase in the volume of traffic, but the increase hadn't materialized at the same time that traffic at National Airport was expanding to the point of overcrowding.

There were some other factors, too. Obviously, the backers of Friendship and Dulles airports were very strongly opposed to any change in National Airport because it meant that the development of their airports was going to be delayed. Dulles International Airport, in particular, was a white elephant. It was losing money every year. There were also people who would have been in the jet patterns, that were very worried about the noise increase and damage to their houses, as there was a lot of talk at that time about sonic boom. All these groups were up in arms about any change at National Airport.

Therefore, the Federal Aviation Agency decided that they'd

Figure 6. PREGNANCY TERMINATION YEARLY REPORT
MIC Simulation—Wayne County

Class and age	Community totals				Program patients			
	Total	Miscarriages	Fetal deaths	Births	Total	Miscarriages	Fetal deaths	Births
White								
10-14	1	0	0	1	0	0	0	0
15-19	222	16	2	204	5	0	0	5
20-24	493	37	6	450	7	0	0	7
25-29	312	17	2	293	7	0	0	7
30-34	174	12	6	156	4	0	0	4
35-39	67	7	0	60	1	0	0	1
40-up	20	1	0	19	1	0	0	1
Subtotal	1,289	90	16	1,183	25	0	0	25
Percentage	100	7.0	1.2	91.8	[1]1.9	0.0	0.0	100.0
Nonwhite								
10-14	6	1	0	5	4	0	0	4
15-19	234	19	5	210	94	2	0	92
20-24	280	19	5	256	127	1	2	124
25-29	166	16	4	146	78	1	1	76
30-34	109	7	5	97	50	0	4	46
35-39	78	9	1	68	35	2	1	32
40-up	15	2	0	13	7	0	0	7
Subtotal	888	73	20	795	395	6	8	381
Percentage	100	8.2	2.3	89.5	[1]44.5	1.5	2.0	96.5
Total	2,177	163	36	1,978	420	6	8	406
Percentage	100	7.5	1.7	90.9	[1]19.3	1.4	1.9	96.7

[1]This figure reflects the percent of the total population of pregnant women who participated in the clinic program as realized in the simulation.

Figure 7. PROGRAM OPERATION YEARLY SUMMARY REPORT
MIC Simulation—Wayne County

Clinic statistics	Case load			Cost (dollars)		
	Total	Mean per month	Standard deviation	Total	Mean per month	Standard deviation
Maternal clinic:						
New patients	388	29.8	4.1	70,125	86	576.2
Case load	2,840	218.5	24.1			
High risk cases, percent	63.3					
Hospital deliveries:						
Case load	359	27.6	5.3	125,258	9,635	2,472.0
Stay time in days	1,115	85.8	22.4			
Infant care clinic:						
New patients	317	24.4	5.3	38,850	2,988	279.5
Case load	1,356	104.3	11.0			
Physician office visits:						
Case load	131	10.1	3.1	1,048	81	24.8
Family planning clinic:						
Case load	215	16.5	3.9			
Birth and death statistics						
Live births	365	28.1	5.3			
Still births	6	0.5	0.5			
Abnormal births	48	3.7	2.4			
Maternal deaths	0					
Infant deaths	14					

Effectiveness measures
Maternal clinic attendance ratio (scheduled visits/actual visits), 1.4
Total personnel utilization ratios (total hrs./hrs. allocated), Maternal, 0.7; Infant, 0.5
Abnormality ratio (program abnormalities/population abnormalities), 1.6

have a study done to look at some of the factors, and that study is what we're going to talk about.

It was intended to provide an assessment of the economic and physical impact in the Washington, D.C., metropolitan area of three policy alternatives.

One was excluding jet services at National Airport, and just leaving things the way they were and seeing what happened.

The second was to permit short- and medium-range jet aircraft operation at National Airport. Essentially, that meant two- and three-engine jets, which were thought of in terms of a 500-mile limit for service. It turned out that Chicago, which a lot of congressmen were interested in, was just beyond that, so it was extended to include Chicago.

Finally, the third alternative was to permit all types of jet aircraft to operate at National Airport. That meant allowing four-engine jets in.

Figure 8. **FACTORS AFFECTING WASHINGTON AREA AIR TRAVEL GROWTH AND LOCAL AIRPORT SHARE OF PASSENGER AND AIR SERVICE ACTIVITY**

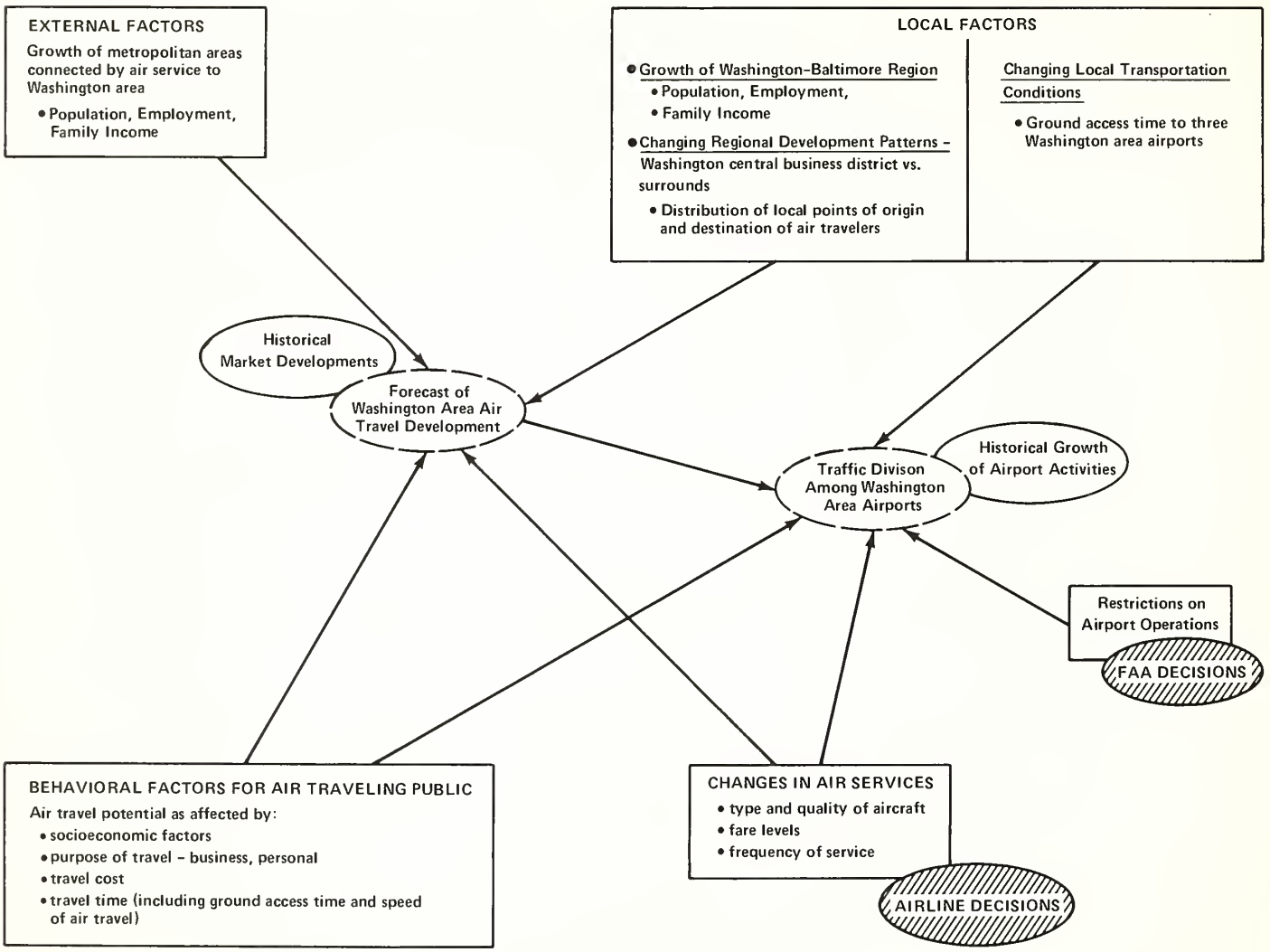

EXTERNAL FACTORS
Growth of metropolitan areas connected by air service to Washington area
• Population, Employment, Family Income
LOCAL FACTORS
• Growth of Washington-Baltimore Region
• Population, Employment,
• Family Income
• Changing Regional Development Patterns – Washington central business district vs. surrounds
• Distribution of local points of origin and destination of air travelers
Changing Local Transportation Conditions
• Ground access time to three Washington area airports
Historical Market Developments
Forecast of Washington Area Air Travel Development
Traffic Divison Among Washington Area Airports
Historical Growth of Airport Activities
Restrictions on Airport Operations
FAA DECISIONS
BEHAVIORAL FACTORS FOR AIR TRAVELING PUBLIC
Air travel potential as affected by:
• socioeconomic factors
• purpose of travel – business, personal
• travel cost
• travel time (including ground access time and speed of air travel)
CHANGES IN AIR SERVICES
• type and quality of aircraft
• fare levels
• frequency of service
AIRLINE DECISIONS

Figure 8 gives an idealized view of the real world system that we're going to try to analyze. This is our abstraction of what's going on. A couple of things that drive it are the shaded boxes, the forecast of what's going to happen in travel development. That's fed by a lot of external factors which you interpret in the light of historical market development. Then there are some behavioral factors for the air traveling public. How they're going to make their choices of what airport they might go to, and so on. Then there is the problem of the division of traffic among the three airports, which depends on the changes in air services and a number of other factors including airline decisions and finally, all this ends up with FAA decisions.

The analysis model that was used is shown schematically in figure 9. In order to provide some kind of time horizon for each of the two alternatives involving jet service, the study undertook to estimate and project for the years 1966 through 1980: (1) the net economic benefits or costs to users, to operators of aircraft services, and the community, (2) the net financial gain or loss to FAA or the operator of National Airport, Dulles International Airport, Friendship International Airport and the airway system, and (3) the new physical demands for new and additional airport and airway facilities.

If you let jets in and traffic expands you'd have to build more and bigger runways, expand the terminal, change the fueling

facilities, provide more parking facilities, and meet all of the investment demands.

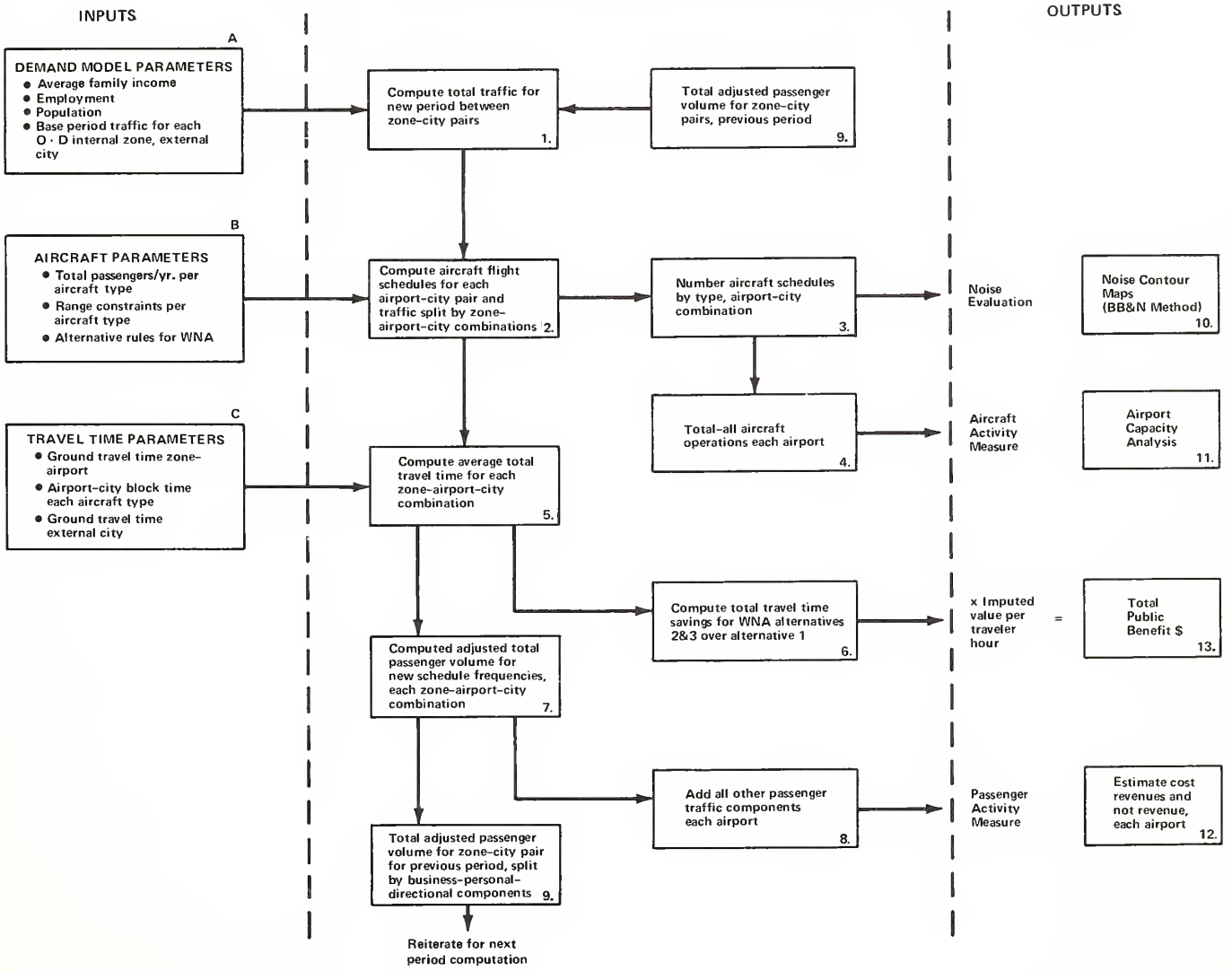
Looking at figure 9 the logic started out in the upper left-hand box. For each of 100 metropolitan areas which were connected to Washington by air service, the socioeconomic composition of the area was projected over the time horizon of the study. Then, using trip generation factors, business travel by industry group was projected and, depending on socioeconomic factors, the number of trips for personal travel was generated. These factors came from surveys of air traffic. It was indicated that wholesale and retail trade would generate the equivalent of 1.78 business trips for each of its employees, construction would generate .92 trips per employee, amusement and recreation would generate .48 business trips per employee per year, and so on. Using all these factors and projecting the composition of the area, it was possible to generate how much traffic might be expected over this time horizon.

There was a separation between flights that terminated in Washington (or had interchange in Washington) and through-flights. Through-flights were subject to different kinds of considerations than those terminating, particularly for the model deciding whether people would go to one airport or the other. This split model, or model for splitting the passenger traffic among the airports is a function of the total travel time. Total time includes the time it takes you to get to the airport, the delay time in how long you'd have to wait for the next available flight depending on which airport you go to, and travel on the other side.

To compute total time, it was necessary to compute ground travel time to the airport. To do this, population growth in the Washington area was projected by zones. With the computation of trips and traffic for each city paired with Washington, block of time during the day, and original destination location within the Washington area, it was possible to project the split of the traffic and estimate how much would go to each of the three airports.

Finally, all this traffic generated requirements for airport capacity as shown on the right-hand side of the output measures. There was an imputed value or benefit to users in terms of how their time was to be valued. There were some conventions among transportation analysts as to how you value a traveler's time. In automobile traffic it's valued at about 4 cents a minute, air travel is at a much higher rate, because it has a lot of business travel by people who have higher paying jobs, and their time is more valuable.

Figure 9. **WASHINGTON AIRPORT ANALYSIS MODEL**


INPUTS
OUTPUTS
A
DEMAND MODEL PARAMETERS
• Average family income
• Employment
• Population
• Base period traffic for each O · D internal zone, external city
B
AIRCRAFT PARAMETERS
• Total passengers/yr. per aircraft type
• Range constraints per aircraft type
• Alternative rules for WNA
C
TRAVEL TIME PARAMETERS
• Ground travel time zone-airport
• Airport-city block time each aircraft type
• Ground travel time external city
Compute total traffic for new period between zone-city pairs 1.
Total adjusted passenger volume for zone-city pairs, previous period 9.
Compute aircraft flight schedules for each airport-city pair and traffic split by zone-airport-city combinations 2.
Number aircraft schedules by type, airport-city combination 3.
Noise Evaluation
Noise Contour Maps (BB&N Method) 10.
Total-all aircraft operations each airport 4.
Aircraft Activity Measure
Airport Capacity Analysis 11.
Compute average total travel time for each zone-airport-city combination 5.
Compute total travel time savings for WNA alternatives 2&3 over alternative 1 6.
x Imputed value per traveler hour
=
Total Public Benefit $ 13.
Computed adjusted total passenger volume for new schedule frequencies, each zone-airport-city combination 7.
Add all other passenger traffic components each airport 8.
Passenger Activity Measure
Estimate cost revenues and not revenue, each airport 12.
Total adjusted passenger volume for zone-city pair for previous period, split by business-personal-directional components 9.
Reiterate for next period computation

Further, it was possible to estimate the costs and the net revenues to each airport because as the traffic changed so the pattern of concessions and fees would change.

In addition to what was done with the scheduled airlines, it was necessary to generate what was going to happen to general aviation. That is, how much flying would be done by people who fly their own planes.

Lastly, shown in box number 10, the noise contours were patterned. That analysis was done by a special group who are the leading experts on noise analysis in the country, possibly the world. The FAA had run some tests in Oklahoma City because there was a lot of concern about sonic boom and the damage from sonic boom. There was no doubt that there was going to be some increase in noise, and it was a question of how much, how objectionable it would be, and what was going to happen.

Roughly, the upshot of all this was that the study found that there would be some diversion of flights from Friendship and Dulles, and the effect of that would be to delay the development of traffic at those airports. But there were strong overall economic benefits to opening National Airport to short-and medium-range jets.

After some pulling and hauling among the people involved—including a court suit—FAA adopted a policy of permitting short- and medium-range jets, two- and three-engine jets, in National Airport.

A little later, because there was so much complaint about the noise, there was an embargo on any jet flights after 10 p.m. So if you're on a jet flight that's going to land in Washington after 10 in the evening, you're not going to land at National Airport.

Mr. Barabba: And you can rest assured that you're going to come in over the Potomac River, no matter what the weather is. Was this put into a computer model?

Mr. Nisselson: Yes. It was a big computer exercise.

One thing that's clear about this problem is that it's going to come up again. But now there are going to be different answers. There will be a rapid transit line out to Dulles which will change them. Then there's going to be a big airport built out further with heliport service.

This study cost about $96,000, and it took 6 months. One of the things that happened is that people began raising questions, and questions were suggested by analysis that hadn't been raised before. After the bulk of the work was done there continued to be a little further analysis.

Student: Would you make a bid before you do the study?

Mr. Nisselson: Yes. A typical process by which studies like this get done is that an agency has an idea of the study they want. They should know something about the state of the art, and if they're in transportation they know these kinds of studies have been done, and maybe they're expecting some new wrinkles to be put in. But they'll write up what they want done, the problem that they want solved, and what kinds of answers they want, and they'll put out what's called a request for proposal.

They might receive 50 or 100 proposals from companies that say they're going to do it, how smart they're going to be, and all the great things they're going to do. Typically, there's a technical evaluation on the part of the government agency to identify the top competitors who will be called in for further interview to see how credible they are. Among the satisfactory competitors, generally a decision is made on the basis of low price. If a government agency, at least in the Federal government, doesn't pick the lowest bidder it must justify why. Procurement regulations are a little less stringent at State and local levels. In fact, many local communities don't have to use competitive bidding at all. When you get bids you may find out you underestimated the problem. But generally, an experienced agency will indicate about how much they're prepared to spend. You don't start out getting studies like this when you don't know anything about the problem or what some of the ways of dealing with it are.

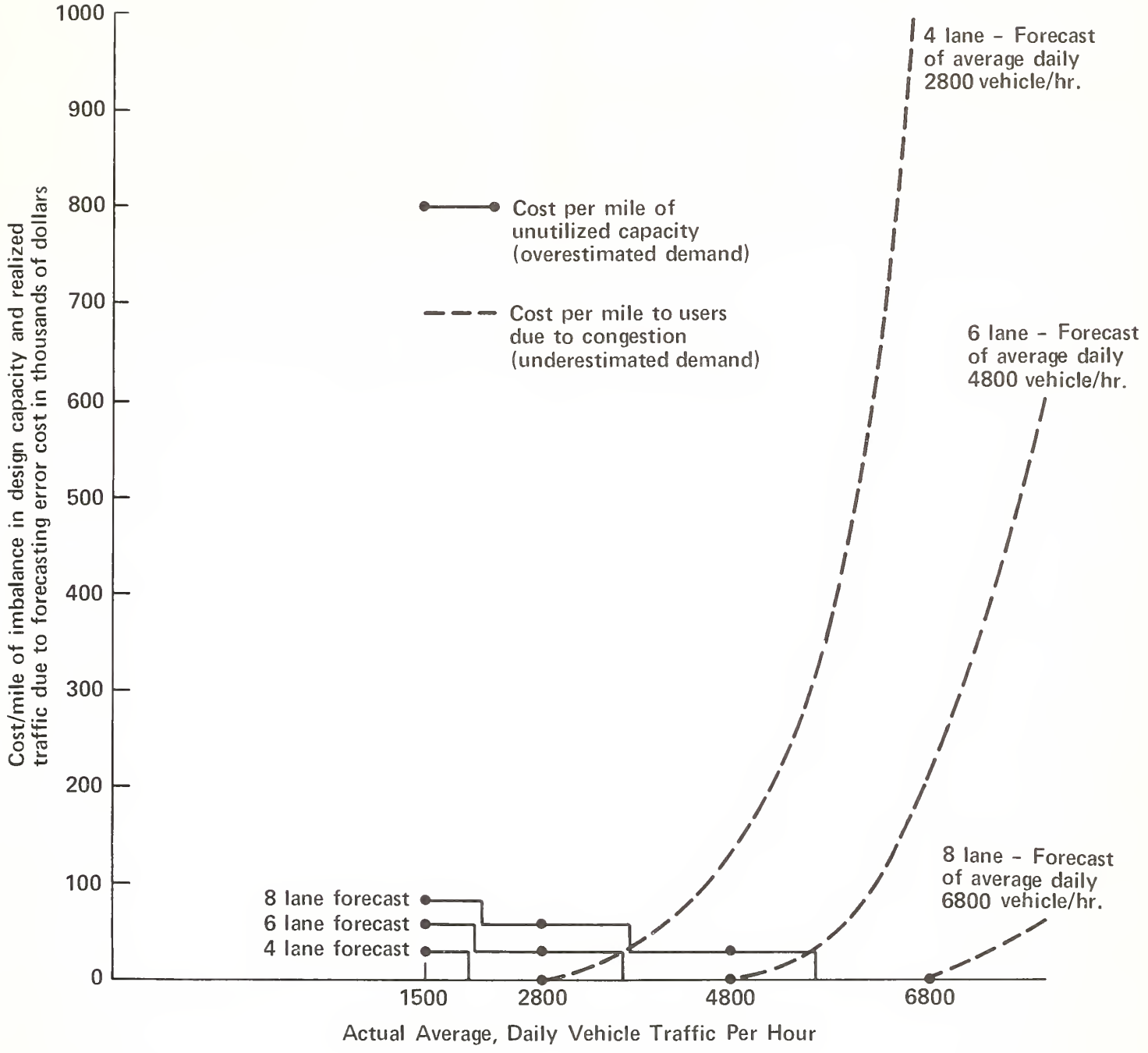
I couldn't resist this last example which is an example of a highway design decision, and it illustrates a couple of things that interest me personally. One is that the timing of a decision may become a policy question. Figure 10 shows, on the "x" axis along the bottom of the chart, some hypothetical actual average daily vehicle traffic per hour, 1,500, 2,800, 4,800, and 6,800. Suppose you make a four-lane forecast and the traffic is, say, only 1,500 vehicles per hour, then you have overbuilt the highway. Plus, you have an investment cost, because you have invested your money in building this highway when you could have done something else with the money. That cost continues until the traffic reaches a four-lane forecast when there is no further investment cost. If you underestimate the traffic and it keeps going up, then that first dotted curve going up exponentially shows what the cost of underdesign is; that cost arises from congestion and its consequences. Similarly, a six- and eight-lane forecast is shown. What this chart illustrates is that for a highway construction program, forecasting errors incur costs through incorrect design decisions.

It also shows, incidentally, that the costs of overdesign and underdesign are not necessarily symmetrical. There's not the same penalty for being off by a given amount of traffic. This figure suggests that to the extent that an improved data base could lead to a reduction in forecasting errors, there is a payoff for good data. In fact, an improvement in the data base is represented by the reduction of cost that would be due to the reduction of forecasting errors. If you really understand a system as well as people understand highway design, you can put a figure on how much information is worth, which is a situation we're not very often in.

Turning to the policy issue, it is interesting to observe that the costs of underdesign are largely private costs incurred by the individual driver and passengers. These are the costs of the increased time spent in travel because of congestion, and there is an increase in the vehicle operation cost due to congestion.

On the other hand, the cost of overdesign is a public cost which is relatively highly visible through tax loads. My feeling is that this may be part of the explanation of why highway facilities at the local level tend to be underbuilt. I don't know if it's been your experience, but in the Washington area, at least, they are always building facilities behind the demand, and when a new bridge is put across the Potomac River or a new highway is completed, as soon as it's completed, bang—it's overused and congested. Traffic engineers can't be that short-sighted. I think it's really this policy issue that's involved,—where the costs are and who bears them. Remember, a lot of decisions have a time horizon, and the question of how good a decision is may be related to a point in time. It's good at one point in time; it's not so good at another point in time. Again, as a statistician and looking at the question of data and the value of data, it's an interesting example where you can really put a price on information.

Figure 10. CONDITIONAL ERROR COST FUNCTIONS OR OPPORTUNITY LOSS FUNCTIONS ACCRUING FROM FORECASTING ERRORS



Student: How can I tie opportunity loss to interpreting data?

Mr. Nisselson: The term "opportunity" just means what else you could do with the money. It's related mainly to the fact that if you've overbuilt you're sinking money into the ground, and you can't do anything with it.

Student: It looks to me, on this chart, that it would be safer to overbuild.

Mr. Nisselson: It depends on whether you're the guy who says taxes are going to be raised, and you're not going to be elected.

Student: It looks like it's enormously safer to overbuild. Am I misinterpreting it?

Mr. Nisselson: No, you're not misinterpreting it. But on the other hand, people are sitting around in their cars, and their time is worth 4½ cents a minute. Who pays attention to costs like that?

Student: On this cost per mile of inbalance on the "y" axis, is that per year?

Mr. Nisselson: It's per year. Those costs were based on some work that Professor John Meyers did when he was at the Harvard Transportation Research group before he became the head of the National Bureau of Economic Research.

Mr. Barabba: I'd like to say a little more about data and the value of good data. Models for analyzing complex systems consume enormous amounts of data, and the results are not likely to be much better than the quality of the data that went into them. It is generally a mistake to assume that the power of analytic tools can compensate sufficiently for inadequacies in the input data. And that is one tie between our subject this morning and the Bureau of the Census. The Bureau's censuses and surveys are an enormous resource for data, and particularly small area data, obtained on a uniform basis over the entire country. And the Census Bureau goes to great lengths to try to assure that the data produced are of a known quality and to inform users of its data availability and the limitations or qualifications.

Besides its periodic censuses and surveys, the Bureau also provides other current data: for example, the cooperative Federal-State program which produces annual estimates of the population by State and county; the program for the Office of Revenue Sharing which produces estimates of population and per capita income for 39,000 places eligible under revenue-sharing; the cooperative program with the Social Security Administration which produces the publication County Business Patterns that gives number of establishments by county with detail by kind of business and size measured by number of employees. Data such as these are useful in themselves, and for developing relationships for model building, but they are also useful as benchmarks. For example, a research group at the Chamber of Commerce in Chicago has been testing out a method for producing current estimates of population by census tract, using data on telephone connections specially compiled for them by Illinois Bell. The data are adjusted to conform to the estimates for Chicago and the balance of Cook County taken from the Federal-State cooperative population estimates program I mentioned. They are very pleased with their first results.

In addition to data, the Bureau also is active in developing methods for relating census data to local data and, in particular, to relating different data sets on the basis of geographic location within a local area. This is a special concern of the Census Use Study. Major activities in developing small area estimates are of two kinds. One approach is called Synthetic Estimates. This starts with a larger area for which reliable relevant statistics are available, say from a sample survey, but for which the corresponding estimates from the sample can't be made for small areas within the larger area with a high enough reliability because there isn't enough sample in the small areas. To develop a so-called synthetic estimate the units, say, population or housing units, are tabulated for the larger area and the smaller area into cells defined by a number of variables related to the statistic of interest. Suppose you are interested in estimating the number of units by small area having a given characteristic. You would take the percent of units having the characteristic in the larger area in each cell and apply that percent to the number of units in that cell for each of the small areas. In the 1970 census this method was used to develop estimates of dilapidated units with all plumbing facilities for States, counties, SMSA's and places of 10,000 population or more. The method assumes that the percent of units in a given tabulation cell having the characteristic of interest is the same in all subareas. When this assumption is not true the synthetic estimate is biased. It is not possible to estimate the bias for any particular area separately, but in the method as used by the Census Bureau it was possible to develop an estimate of a root mean square error for groupings of publication areas, or areas for which data were published separately.

The other kind of activity is based on more conventional regression estimates such as those used in making current population estimates. Such regressions attempt to relate population change, which, of course, is unknown unless a special census has been taken, to so-called indicator variables or changes in such variables. By indicator variables we mean characteristics of the area which are correlated with the variable of interest (population change). For example, in the case of estimates by census tract in Chicago I mentioned, the indicator variable was telephone connections. The methods now being developed attempt to incorporate into the regression equations independent estimates of the variable of interest for a sample of areas which may be based on either a census or sample survey of the sample areas. This approach, which seems promising, is applicable to any area comprised of subareas and in which independent estimates are available for a sample of areas.The term "sample" needs comment. Just any subset is not a sample, but the subset should be selected as a probability sample of all areas for which the regression equation is to be developed. It is a matter for real concern when indicator variables come from administrative records, or program records, whether the data are good enough. It's absolutely necessary if you want to get a good data base from administrative records and maintain a consistent base from year to year to have a quality control operation at the source. This is particularly important for social indicators, and for local uses, in which data may come from programs in which the focus of attention is the program rather than the program statistics.

GBF/DIME SYSTEM—THE DIFFUSION OF AN INNOVATION

Vincent P. Barabba, Director, U.S. Bureau of the Census

"I would like to emphasize that in the adoption of many systems it is crucial to ensure the ultimate choice not be limited to only the nominal head or a relatively few leaders of an organization. Those employees in any position of influence, as well as those who would use the system, should be alerted to the impending decision and encouraged to express their opinions."

Vincent P. Barabba

Mr. Barabba: The past sessions have described systems, tools, and information available as an outgrowth of Federal or private statistical efforts. However, we still need to explore the process and problems of having one of these sytems or tools adopted by organizations or individuals.

For the purpose of this discussion I would like to use the Census Bureau's GBF/DIME system and the history of its adoption as the case in point. The GBF/DIME system (geographic base file/dual independent map encoding) provides a more systematic utilization of census data and administrative records for program evaluation than was heretofore available to statisticians, planners and organizations interested in the analysis of small area data (see appendix). At one time the GBF/DIME system was an entirely new statistical tool being offered to a large public of potential adopters, many of them totally unaware of its potential uses. A lack of understanding of the system was partially responsible for an initial reluctance on the part of some to accept the system. Today the GBF/DIME system is a generally accepted tool employed throughout the U.S. This will not be a discussion of why a community or organization should have adopted or should now adopt the GBF/DIME system. Instead, I want to orient my presentation so that we can outline the problems and procedural steps involved in having any new system or tool adopted.

Everett Rogers, Professor at the University of Michigan, [1] clearly illustrates that an extremely meaningful concept which is known by, and beneficial to, individuals or those persons representing an organization may not be accepted because of a failure on the part of those presenting the new tool to properly understand and utilize the innovation adoption process.

For the purpose of our discussion let me identify an innovation as being any idea, way of doing things, or material object that is new to a given individual or group of individuals. Therefore, an innovation could be widely used by some people, and yet new to a given group. The innovator may be said to be an individual who promotes the adoption of the new idea or tool. Almost every area of public concern has one or more types of innovators or concept promoters. Some examples are technical assistance workers in less developed countries, dealers in new products, salesmen, public health officials, doctors, and administrators, among many others.

Now, conversion to a computerized geographic file system is not much different than converting to any computer-oriented system. Recently, an officer of a large corporation identified the principal reasons why firms are slow to adopt new computer techniques in their marketing programs. A very real difference between the marketing and computer systems personnel, and the organizational separation of these units, contributes to misunderstanding and lack of communication; inflated expectations of computer capabilities are created by overselling, which often lead to misuse of the computer by top level management. He added that competition discourages innovations because of the time needed to make the system operational and relatively error-free.

Likewise, persuading a community or organization to adopt a computerized information system is not easy. Critics warn that in implementing the system, the local planners will soon find they cannot afford it; their first program will be unsuccessful; they will be personally embarrassed; they will try to save the sinking ship, and 50 percent of what they finally develop will be untimely, unnecessary, and too expensive.

Therefore, before you introduce any innovation to an agency or corporation, you must really understand the people involved, both as individuals and as a group. To understand them as individuals, we need to know several things. What is their ability to handle sophisticated tools? Do they basically understand what's involved? How secure are they in their positions? What are their values? And, can they influence others?

To understand how the members interact, we need to know how traditional the group is. Do they do something a certain way because they have always done it like that, or are they willing to try new ideas? What are the organization's characteristics? The pressures developed by each organization must be handled differently. It is equally important to remember that the acceptance of an innovation does not ensure its use by the organization. Therefore, the first step is to take a good look at the organizational environment from both points of view.

Rogers cites four phases in the innovation adoption process. These are the knowledge, persuasion, decision, and confirmation stages.

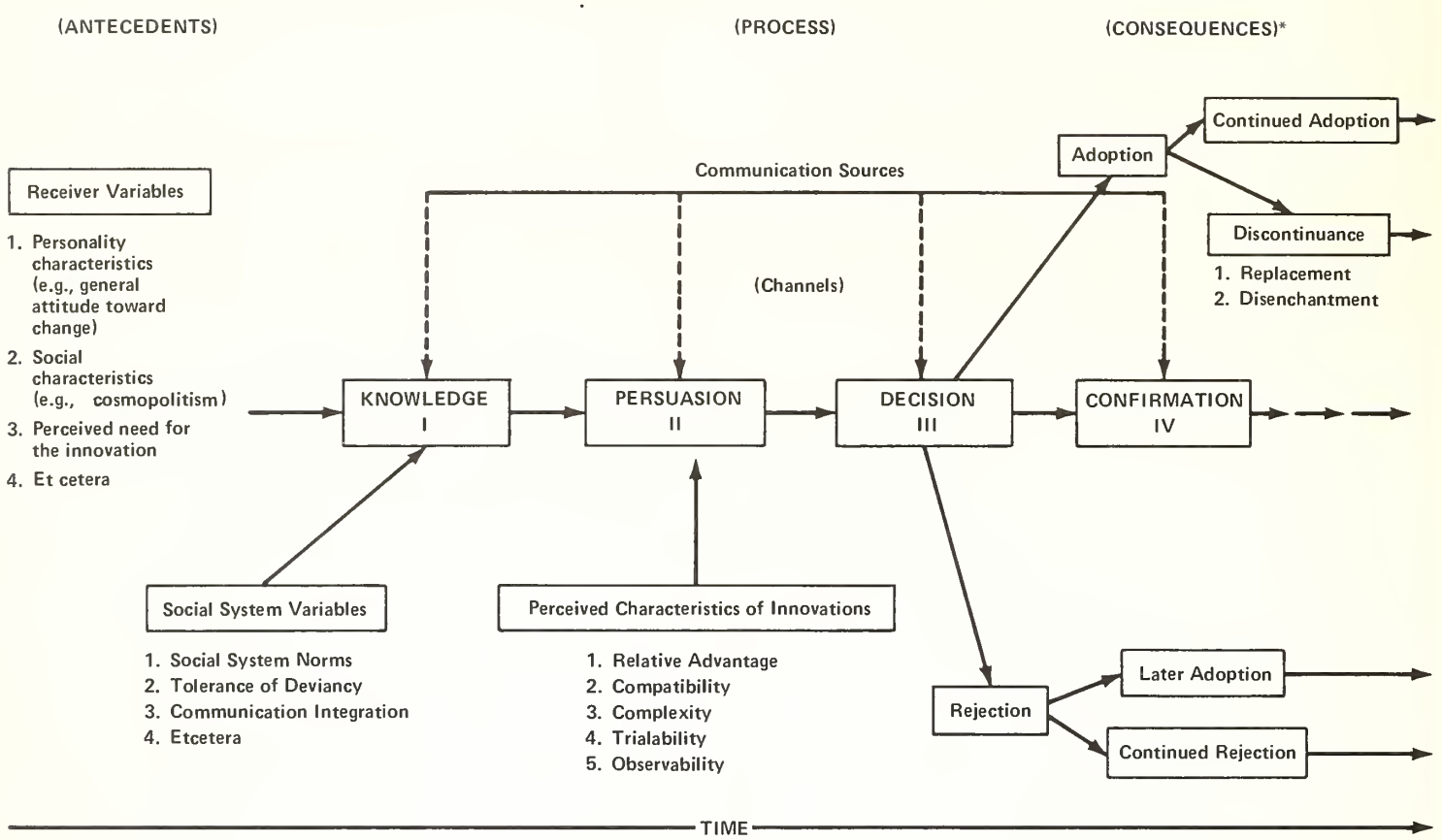
First, in the knowledge stage the individual is exposed to the innovation's existence, and he gains some understanding of its functions. The individual's attitude toward the innovation hinges on whether he sees the innovation as a solution to a problem or a threat to his own continued employment.

Second, during the persuasion stage, the individual forms a favorable or unfavorable opinion about the concept. The individual becomes more psychologically involved as his knowledge of the innovation increases. Since there is some degree of risk involved in adopting an innovation, he may seek reinforcement of his attitude from his peers.

During the third phase, the decision stage, the individual undertakes activities which will ultimately lead to the adoption or

[1] Everett Rogers, **Communication Of Innovations,** The Free Press, New York, New York, 1971; **Diffusion Of Innovations,** The Free Press, New York, New York, 1962.

PARADIGM OF THE INNOVATION-DECISION PROCESS



* For the sake of simplicity we have not shown the consequences of the innovation in this paradigm but only the consequences of the process

rejection of the innovation. Rogers points out that most individuals do no accept an innovation without first using it on a probationary basis to determine its utility. Because of the obvious advantages of a trial prior to adoption, those innovations available for a trial period are generally adopted more rapidly. But, it is just as possible the trial will result in the rejection of the concept. Rogers suggests that while rejection may occur at any time, it usually happens at this point in the adoption process because the results of trail are misinterpreted.

An example of this misinterpretation comes from the report of an Iowa farmer who tried to increase his crop yield by applying nitrogen fertilizer. Although he gained a higher crop yield, the farmer erroneously attributed the death of two cows, that had actually died from eating wet clover, to the new fertilizer. Therefore, he rejected its use. Later interviews indicated the farmer's neighbors were not using the nitrogen fertilizer because of his experience.

Based on empirical evidence, Rogers and others suggest there is an additional stage beyond the initial decision to adopt or reject the innovation. This fourth stage is one of further testing by direct application and confirmation. The individual seeks further reinforcement of his attitude.

I would like to emphasize that in the adoption of many systems it is critical to ensure the ultimate choice not be limited to only the nominal head or a relatively few leaders of an organization. Those employees in any position of influence, as well as those who would use the system, should be alerted to the impending decision and encouraged to express their opinions.

An important ingredient dictating how an innovation fares through this process of adoption is the innovation itself. But, how the concerned individuals perceive an innovation also affects, the adoption. The individual's perception of the innovation centers on five characteristics: (1) the ability to identify the relative advantages of having such a system versus not having it; (2) the ability to illustrate the manner in which such an information system is compatible to present organizational procedures; (3) the ability of successful and qualified people from many areas of endeavor to quickly absorb the technical jargon of a vast and complex tool; (4) the need to divide the concept and test it in a way that no person or organization feels threatened; and (5) communicating the results of the effects of such an information system.

Depending on the individual adopters the use of the Census Bureau's community geographic-oriented information system has not had universal acceptance because of the reactions to the characteristics I have just mentioned.

In assessing the adoption of the Bureau's GBF/DIME system, three groups emerge: Those who had almost instantaneous support for the concept, those who were neutral, and those who were opposed.

Supporters of the system can be subdivided by their motives for support. Realizing the need for new techniques to structure and retrieve the vast amount of data generated by local agencies, and the difficulty of integrating the available data for small geographic areas, some supporters recognized the potential of the concept to make their work easier and more accurate.

These were primarily planners and researchers. Another subgroup was moved to support the concept because of the Bureau's sponsorship. The Bureau's reputation in statistical and geographic matters is widely known and respected. These supporters were accustomed to working with the Bureau, and they believed that adoption of the concept would result in better censuses. They also realized the capabilities of the system have been successfully demonstrated in New Haven, Conn., and Los Angeles, Calif., and the documented applications and procedural guidelines are readily available to them.

Those individuals who were neutral, such as planning directors and county department heads, were not likely to be the direct users of the concept. This group would be using the product of the system, rather than the system itself, and they tended to rely on the advice of technical subordinates.

Those who were opposed can also be subdivided by their motive. One subgroup, agencies that already had geographic base files and address matching software, perceived the concept as a threat to their operations. They felt its adoption would detract from their systems or lead to a centralization that would eventually result in a transfer of functions over which they had control. Others not immediately supporting the idea were budget analysts and administrators, whose job it was to question all new programs and projects.

Now that we have examined the basic elements of the adoption process and outlined those groups that were exposed to the GBF/DIME system, let's view the adoption of the system through Roger's four stage process.

Knowledge

The identification or matching of data to geographic units is not new. In the past, before electronic data processing, the geographic identification was done manually and crudely, because the sources of geographic identification were mainly maps or city directories. For example, the numerous transportation studies which started in the late 1940's identified the origin and destination of trips in order to code them to a transportation zone. In the 1955 transportation study of Washington, D.C., approximately 10 to 15 percent of the households were sampled, and about 180,000 origins and destinations were located and identified. This was done using Sanborn maps and Polk and other directories.

The first exposure of governmental agencies and private organizations to a standardized type of geographic file adaptable to a computer information system was the Address Coding Guide (ACG) which was the forerunner of the GBF/DIME system prepared for use in the 1970 Decennial Census of Population and Housing. However, these files were developed to meet a specific Bureau need, and the idea that they could have potential use or value at the local level was not widely comprehended outside the Census Bureau.

As the potential for, and the GBF/DIME system itself evolved, information regarding the system's capabilities was distributed through meetings and conferences sponsored by the Bureau, published papers, the Bureau's SAD (small area data) Notes, and professional society meetings. The Bureau's Geography Division, because of its continuing contacts with local, State, and Federal agencies, handled the development and implementation of the file. The Census Use Study was assigned the task of identifying research applications of the file to local needs.

Persuasion

The persuasion phase began in the early 1970's, and the Bureau immediately faced some hard questions from the potential users. By 1972, governmental agencies and private organizations had some knowledge of the system, but there was confusion about the differences between the ACG, GBF, and DIME programs and their capabilities. Potential users were uncertain which system best filled their needs. Other interested parties were concerned with the availability of support programs; they were uncertain of the costs and origin of financing to develop user programs for the file. In other words, there were the costs of developing the file, and the costs of establishing programs to use with the file. A third consideration was the maintenance and extension of the files. The Bureau's CUE (Correction, Update, and Extension) program was oriented to several updates at 2- or 3-year intervals—funds permitting—to achieve the most accurate and current file of all areas for use in coding the 1980 census address file.

There were many programs for which a file and a computerized geocoding system could be used, such as those of Housing and Urban Development, (HUD), the Office of Education, and the Law Enforcement Assistance Administration (LEAA). Each agency that worked with the Census Bureau in the GBF/DIME system development received a detailed report of the concept capabilities. However, agency administrators were neutral toward the new system. They foresaw the benefits of the system, but would become involved only if additional monies were made available to finance its implementation. Fortunately, organizations such as HUD and the LEAA made funding available.

The GBF/DIME system was geared to standardization on a nationwide basis, meaning that techniques developed for one area would become available to other areas in a form which could be readily utilized. The CUE procedures were designed by the Bureau, thus eliminating development costs for the local agencies, which were offered free service to process the sytem, if they had no computers of their own.

Of course, the benefits of standardization required all local agencies to conform to common formats and data elements, at least in that portion of the file used by the Bureau. This conformity required some agencies to carry data which were of no apparent use locally.

Despite the advantages of the system, the preliminary criticisms of those initial users reinforced the negative attitudes of potential users. The criticisms concerned the "overselling" of the system's availability and its immediate application and use, and the imperfections in the files. Admittedly, those first files were not perfect. Beyond the anticipated problems, there were difficulties arising from the poor quality of local address information, and the lack of a corrected, updated system and an edit and correction process. There was a lack of support from local officials, who failed to recognize the value of this sytem as a management information and decisionmaking tool capable of relating local data to the geographic distribution of socioeconomic data. Because of the criticism, problems, and lack of support, some administrators adopted alternate systems to meet their needs rather than wait for the perfected GBF/DIME system.

To combat the bad publicity and administrative reluctance to adopt the system, the Bureau aimed its persuasion efforts at the agencies' mid-level technicians in the hope of influencing the decisionmakers through their staffs. In these mid-level meetings, the merits of competing systems were debated. For example, one existing system was more efficient than the GBF/DIME system. But the latter provided more flexibility than the existing system.

Decision

As I stated earlier, the decision stage is when an individual actually engages in activities, such as a trial use, which lead to the adoption or rejection of the innovation. In our case, meeting with Bureau representatives may have been sufficient for some persons; for others, a written agreement was necessary. The Bureau held a number of conferences, meetings, and workshops at the local and national level for those individuals interested in developing the system or already using it.

The GBF/DIME system has a wide variety of uses, as evidenced by the comments and testimony of those already employing the system. Operating units throughout the country have adopted the geocoding and mapping technique to provide inventories of everything from streets and roadways to water and sewer systems, from motor vehicle registration to voter registration, and for planning the best location of firehouses, day care centers, schools, and public recreation sites. Schedules of social service caseworkers have been plotted for greater efficiency. Mapping and evaluating public transit services and profiling neighborhoods for their crime, accident, and redevelopment characteristics have all been undertaken. With the system's assistance residency checks and tax collection evaluations are performed. And at least one newspaper has employed the system to evaluate its subscription campaign and assist its advertisers.

At this point the many uses should be obvious. Naturally, there are undiscovered applications as well. As the system's adopters become aware of the already developed uses, its utilization will increase, or to put it another way, the decision to adopt the system will be affirmed and reaffirmed.

Confirmation

There are now 205 SMSA's that have prepared a file and have begun using the system, as their various local management operations and research programs permit. Not all 205 files are in the same condition. Even after the initial development of a file, there are naturally residual errors that must be corrected. In addition, characteristics of urban growth or change must be included in the files.

Sixty-five SMSA's have yet to prepare a file, although a large number of these will do so as soon as money and personnel become available.

Appendix. Geographic Base (DIME) System

Background

In 1970 the Bureau of the Census conducted the Nineteenth Decennial Census of Population and Housing by a combination of two methods: a mail canvass in the large urban areas of the nation and a house-to-house enumeration in the remainder of the country.

For the urban cores, covering the postal city delivery areas of 145 standard metropolitan statistical areas (SMSA's) in which the mail-out/mail-back procedures were used, a method was needed to code individual addresses on the mailing list to specific geographic areas for tabulation purposes. A master coding file was developed to code approximately 40 million addresses by computer to the appropriate geographic areas. The coding file developed specifically for this purpose was called the address coding guide (ACG).

The address coding guide worked well in the geographic coding of the census questionnaires; however, after preparation of the ACG's were well underway (and the census date was too close in time to permit change in the system), it was realized that there were certain limitations to the file and some desirable improvements should be made when feasible. The file, as initially developed, would not permit comprehensive editing of the records by computer. Also, because of the work involved in file development and the time available, the ACG's X-Y coordinate values and non-street information – railroad tracks, drainage features, etc., reflected on the Metropolitan Map series and capabilities of inclusion in computer mapping—were not planned as part of the original ACG development but were scheduled for post 1970 census improvement.

Using graph theory as the conceptual framework, the solution combined the ACG file with information necessary to describe the urban street network. By considering each street as a line and each intersection as a node, the entire region could be viewed as a series of interrelated nodes, lines, and enclosed areas. Other features, such as streams or jurisdiction boundaries, could also be defined in terms of segments and nodes. This approach was called DIME (Dual Independent Map Encoding) and the entire program is now referred to as the Geographic Base File (DIME) System or GBF/DIME System.

The term DIME refers to the fact that the basic file is created by coding two independent matrices (a) the nodes at the end of the line segments and (b) the areas enclosed by the nodes and line segments.

File Development

Before developing a GBF/DIME file, the Census Bureau's Metropolitan Map series is reviewed and those places on the map where a street or nonstreet feature intersects another feature, comes to an end, or has a definite change of direction are identified with a "node point" and labeled with a dot and a unique identification number (fig. 1). A segment is that portion of a street or non-street feature located between two nodes. It includes the geographic and address codes pertaining to both sides of the feature. Each segment can be described by its node points as well as by its name. For example, nodes 71 and 77 identify a section of Kimball Avenue.

A record is then prepared for each line segment which will contain a series of geographic identifiers or code for the segment's characteristics or for the area on either side of the segment. A description of the geographic elements which appear in the file follows this explanation. Figure 2 illustrates some of the information contained in the file for the 100 block of Kimball Avenue.

Figure 1

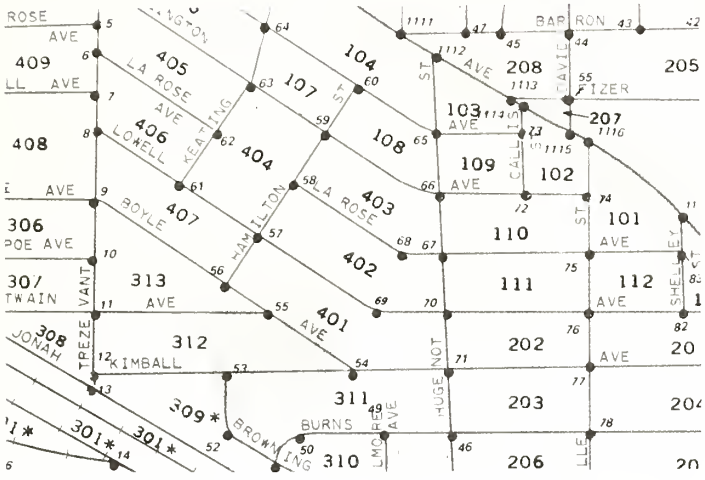
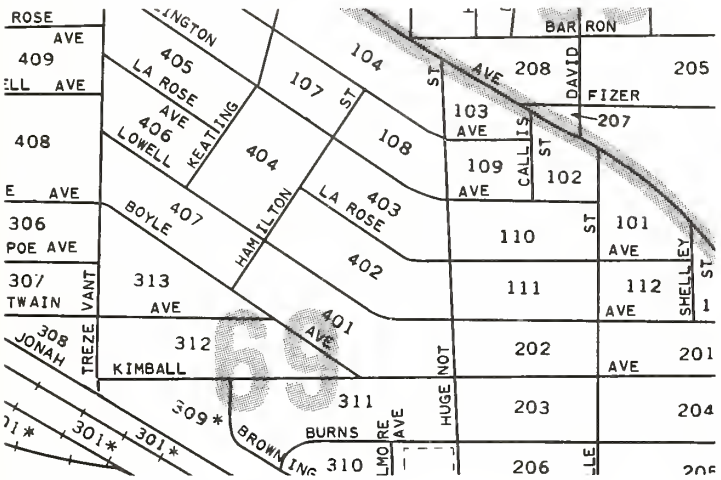


Figure 2



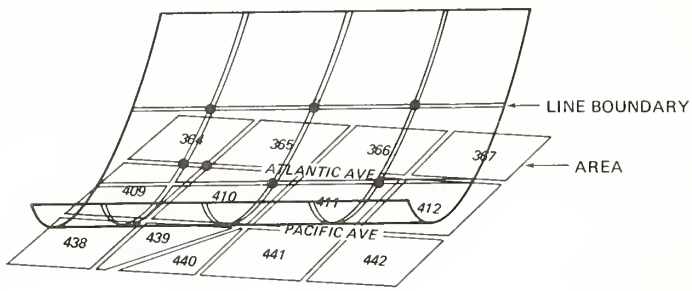
For each street segment a record contains:

From Node	71
To Node	77
Street Name	Kimball
Street Type	Avenue
Left Addresses	101-199
Right Addresses	100-198
Left Block	202
Left Tract	69
Right Block	203
Right Tract	69

By identifying each line segment, its node points, and the enclosed area, this technique of geographic description facilitates a computerized check for internal topological consistency. For example, the computer can link the node points around a block to determine whether all segments of the block are accounted for and the codes assigned to each segment are complete and consistent.

Although the file is now topologically complete, it cannot yet be translated into a map image. The *x-y* coordinates of each node must be determined and entered on the corresponding computer record to establish the spatial relation of the nodes to the line segments (fig. 3).

Figure 3



Use and Users

The GBF/DIME system is the result of 10 years of effort and is the Bureau's prime geoprocessing resource. However, it has become an important element for geographic processing for agencies at the city, county, regional and State levels as well.

Correlating local physical, social, and economic data via street addresses, geographic codes, and coordinates provides a flexible framework for administration, not only within specific agencies or programs, but also for analysis of relationships of diverse variables, such as juvenile delinquency and school truancy. Local data can also be compared to available Bureau data when processed by the GBF/DIME method.

Some uses of the GBF/DIME system are—

A. In Urban Transportation Study programs the system is used to locate by transportation zone the distribution of motor vehicles that are registered within a community; the geographic origin and destination of daily trips; and in the study of the journey to work the distribution of employment which is used to study the journey to work.

B. In criminal justice programs, local police departments are using GBF/DIME to determine geographic patterns of crime in order to optimize the design of police beats and manpower allocation. The GBF/DIME program also forms the basis for computerized dispatching systems of police and fire departments.

C. In educational programs, local school boards use the files to determine the geographic distribution of children by grade to improve school facility planning and revise school district boundaries in order to distribute pupil loads more equitably.

D. In urban planning, many departments use the GBF/DIME in their housing condition surveys to locate deteriorating neighborhoods as a basis for planning remedial action.

INDEX

CENSUS, 1970
Currency of, 21
Magnitude of, 107
Problems
content, 115
coverage, 115
definitional, 112
geography, 109
interviewer recruitment, 108
Precedure for, 107, 109
Questionnaires
mail, 118
changes, 14
Release, levels of, 151
Response rate, 108
Synthetic estimates, 188
Undercount, 111

See also Survey Research, Current Population Survey

CURRENT POPULATION SURVEY
Census, March "mini-", 117
Changes, 117
Decennial census, update to, 2, 13
Design of, 116
General, 116
Household sample, definition of, 6
Inflation, measures of, 49
Information collected, 118
Unemployment, details of, 117

DATA QUALITY
Accuracy checks, 115
Demographic analysis, 115
Error, 7
Imputation of data, 115
Interviewers
census, 118
private, 61
Questionnaires
mail, 83
general, 109

FEDERAL STATISTICAL SYSTEM
Committees, interagency, 143, 150
Components, 142
History, 138
Nature of, 138
Planning process
general, 142
future developments, 145
Problems with, 143
Programs, factors influencing, 143

See also Users, Reporting Burden, Public Policy

GRAPHICS
Computerized mapping, 97
Data, accuracy, 95
Indicators, 89
Indices, 91

HEALTH STATISTICS
Commercial uses, 32
Collection, selective, 37
Currency, 39
Expert opinion, 166
Foreign, comparison with, 34
Goals for, 34
Geographic coding, 3
Law concerning, 30
Measurement, numerator and denominator, 1
Model, maternal infant care program, 180
National Center for, 30
Sources of, 31
Vital Statistics System, 31

See also Surveys, Reporting Burden, Users

HOUSING
Change, components of, 54
Familization status, 91
Measures over time, value of, 113
Moves, potential for tracking, 56
Neighborhood change, slight, 152
Trends, occupancy, 58

See also Small Areas, Census 1970, Surveys

INNOVATIONS
GBF/DIME System, 189, 192
Perception of, 191
Stages of, 189

MARKETING
Advertising, direct mail, 151
Census data, relating names and addresses to, 154
Goods, distribution of, 19, 154

See also Privacy

MINORITIES
Aliens, illegal, 111
Language problems, 108
Response rates, 7
Undercount, 111

NATIONAL ACCOUNTS
Basic concept, 41
Consumer Price Index, 146, 168
Criticisms, 42, 45
Detail of data produced for, 117
Economic measures, beyond, 42
Goals, purpose of, 41
Historic development, 41
Image of, 159
Measurement difficulties, 43
Schools of thought, 12
Uses, current, 46

See also Current Population Survey, Social Indicators

PRIVACY
Aggregate information, distinction, 19
Census Bureau's mission, 25
Case histories, 27
Census, processing, 28
Census questionnaires
justification for detail, 26
release by Archives, 29
storage of, 29
Comparison, U.S. versus others, 18
Cost, 25, 60, 62
Current developments, 25
Definition of, 27
General, 8
Health records, 40
Legal aspects, 25
Legislative history, 26
Mailing lists, 19
removal from, 157
Manipulation, fears of, 23
Marketing
congressional concern, 152
techniques, 152
Names as census identifiers, 18, 109
National Center for Health Statistics, 30
Procedures for collected information, 61
Questions, intimacy may violate, 33
Record sharing, IRS, Social Security, 9
Statistical planning, effect on, 143
Technology can promote, 28
Telephone solicitors, 20
Universal identifier, Social Security, 29

PUBLIC POLICY
Census, congressional and administration impact on, 112
Case study, Washington National Airport, 182
Federal Statistical System
interagency committees, 143, 150
budget, 143, 146
Fiscal restraints, 50
Privacy, philosophical problems, 17
Statistics, pressures on, 4
Timing of decisions, 186
Users, explanation of material, 59

REPORTING BURDEN
General, 142
Forms clearance, 149
Health surveys, 36
Need for information, 26
Research and development, 29
Study to determine, 147

SMALL AREAS
Area profile report system, 152
Census Bureau, 188
Change, 152, 154
Estimates of, 188
Graphic approach, applicable to, 89
Value of information, 158

SOCIAL INDICATORS
Cost of information, 1
Corporate involvement, criticisms of, 171
Corporate performance, measurement, 173
Corporation, socializing the, 170
Definitions of, 12, 104, 160
Goals
consensus on, 168
defining what to measure, 160, 179
techniques for discovery, 166
Health statistics, 39
History of, 162, 166
Images
reality of, 170
of society, 170
International concerns, 13, 105
Information
versus data, 151
tracking versus new data, 114
uses of, 54
Local areas, 169
Maximization, as a goal, 173, 179
Measurement
case study, 167
available data, uses of, 174
economic welfare, 45
Numerator and denominator as measures, 1, 154
Rank order
indices, 54
key factors, 57
Social Area Analysis, 90
Unemployment, 168

See also Graphics, Health Statistics, National Accounts, Social Observatories

SOCIAL OBSERVATORIES
Census Bureau, 13
Definitional problems, 15
Need for, 11
Social indices, link with, 13

See also Social Indicators

SURVEY RESEARCH
Advantages of, 77
Analytic strengths, 81
Case studies, 81
Data linkage, primary and secondary, 81
Ecological fallacy, 81
Firms, selection of, 86
Sample selection, 5, 80

SURVEY TECHNIQUES
Analysis, logic of, 78
Delphi, polling the experts, 166
Echo, 79
Likert, 79
Null hypothesis, 87
Randomized response, 33
Scaling, 79
Semantic differential, 79

SURVEYS
Census comparison with R.L. Polk, 53
Consumer expenditure, 26
Criminal victimization, 119
Health
patient examination, 31
physicians, 34
international, 110
Household income, 57
Population, annual estimates, 188
Postcensal, 112

See also Census 1970, Current Population Survey

SYSTEMS ANALYSIS
Firms, selection of, 186
General, 177
Models, criticisms of, 179
Transfer function, 177

USERS
Age Search, 110
Access to data, 148
Census Bureau orientation toward, 14
Census questions orientation toward, 155, 158
Census Use Study, 59
Corporate performance, measurement data available, 174
Data dissemination, 39, 147
Federal Statistical System, advisory committees, 145
Geographic coding, 2, 14
Health statistics, 35, 38
Information, changing needs, 156, 158
Society, innudated with data, obligation to potential users, 4
State and local cooperation, 148
Statistical definitions, inputs to, 5
Statistics, using those available efficiently, 21

See also Public Policy

technical papers

No. 1. The Sample Survey of Retail Stores: A Report on Methodology
... Description of the Sample for the Monthly Retail Trade Report (unnumbered revision)
No. 2. Accuracy of Census Statistics With and Without Sampling
No. 3. Farm Population, 1880-1950
No. 4. The Post Enumeration Survey: 1950
No. 5. Tests and Revisions of Bureau of the Census Methods of Seasonal Adjustments
No. 6. The Current Population Survey Reinterview Program, Some Notes and Discussion
No. 7. The Current Population Survey, A Report on Methodology
No. 8. Trends in the Income of Families and Persons in the United States: 1947-1960
No. 9. Reconciliation of the 1958 Census of Retail Trade with the Monthly Retail Trade Report
No. 10. Population Trends in the United States: 1900 to 1960
No. 11. Response Errors in Collection of Expenditures Data by Household Interviews: An Experimental Study
No. 12. Estimating Trading-Day Variation in Monthly Economic Time Series
No. 13. Sampling Application in Censuses of Population and Housing
No. 14. The International Standard Industrial Classification and the U.S. Standard Industrial Classification
No. 15. The X-11 Variant of the Census Method II Seasonal Adjustment Program
No. 16. Present Value of Estimated Lifetime Earnings
No. 17. Trends in the Income of Families and Persons in the United States: 1947 to 1964
No. 18. Changes Between the 1950 and 1960 Occupation and Industry Classification
No. 19. The Current Population Survey Reinterview Program, January 1961 through December 1966
No. 20. Correlation Between United States and International Standard Industrial Classifications
No. 21. Characteristics of America's Engineers and Scientists: 1960 and 1962
No. 22. Measures of Overlap of Income Distributions of White and Negro Families in the United States
No. 23. The Position of United States in World Commodity Exports in 1968
No. 24. The Annual Survey of Manufactures: A Report on Methodology
No. 25. Demographic Computer Library
No. 26. 1970 Occupation and Industry Classification System Showing Sources
No. 27. Sampling Applications of the 1970 Census Publication, Maps, and Public Use Summary Files
No. 28. From the Old to the New 1972 SIC for Establishments
No. 29. Scientific and Technological Development Activities of the Bureau of the Census
No. 30. Census County Division, Past and Future
No. 31. Consistency of Reporting of Ethnic Origin in the Current Population Survey
No. 32. Standards for Discussion and Presentation of Errors in Data
No. 33. Characteristics of Persons in Engineering and Scientific Occupations: 1972
No. 34. Indexes to Survey Methodology Literature
No. 35. Family (Money) Income 1947 to 1971: Summarizing Twenty-Five Years of a Summary Statistic
No. 36. Census Bureau Programs To Measure Consumer Purchase Expectations: 1959-1973
No. 37. The Census Bureau, A Numerator and Denominator for Measuring Change
No. 38. Comparison of Persons of Spanish Surname and Persons of Spanish Origin in the United States

To receive further information or to order copies of these reports, contact the nearest district office of the Department of Commerce or write to--

SUBSCRIBER SERVICES SECTION (PUBLICATIONS)
SOCIAL AND ECONOMIC STATISTICS ADMINISTRATION
WASHINGTON, D.C. 20233

U.S. DEPARTMENT OF COMMERCE
Social and Economic Statistics Administration
BUREAU OF THE CENSUS
Washington, D.C. 20233

U.S. DE

PENN STATE UNIVERSITY LIBRARIES
A0000709623B3

OFFICIAL BUSINESS

working papers

No. 1. Raw Materials in the United States Economy: 1900-52 (Preliminary)
No. 2. The Role of the 1954 Census of Manufactures in Overcoming Problems of Industry Data
No. 3. Tract Data Compared for a 25-Percent Sample and a Complete Census
No. 4. Sampling in the 1950 Census of Population and Housing
No. 5. Occupational Trends in the United States: 1900 to 1950
No. 6. Raw Materials in the United States Economy
No. 7. Papers Presented at the Census Tract Conference, December 29, 1958
No. 8. Materials on the Preparation and Conduct of the U.S.S.R. All-Union Population Census of 1959
No. 9. Historical Comparability of Census of Manufactures Industries: 1929-1958
No. 10. Papers Presented at the Census Tract Conference, December 29, 1959
No. 11. Papers Presented at the Census Tract Conference, August 25, 1960
No. 12. Papers Presented at the Census Tract Conference, August 28, 1961
No. 13. Papers Presented at the Census Tract Conference, September 8, 1962
No. 14. The Spectral Analysis of Economic Time Series
No. 15. Methodology and Scores of Socioeconomic Status
No. 16. Procedural Report on the 1960 Censuses of Population and Housing
No. 17. Papers Presented at the Census Tract Conference, September 5, 1963
No. 18. The Measurement of Performance Potential in Manufacturing Establishments
No. 19. Tests of Use of Post Office Resources to Improve Coverage of Censuses
No. 20. Industry Classification and Sector Measures of Industrial Production
No. 21. A Spectral Study of "Overadjustment" for Seasonality
No. 22. Papers Presented at the Census Tract Conference, December 29, 1964
No. 23. Spectral Analysis and Parametric Methods for Seasonal Adjustment of Economic Time Series
No. 24. Self-Enumeration as a Method for the 1970 Census of Housing
No. 25. Measuring the Quality of Housing
No. 26. Changes in the Structure of Manufacturing Employment
No. 27. Methodology of Consumer Expenditures Survey
No. 28. Metropolitan Area Definition
No. 29. Survey Applications of Social Psychological Questions
No. 30. Raw Materials in the United States Economy: 1900-1966
No. 31. Price Variation in New FHA Houses: 1959-1961
No. 32. Pretests and Dress Rehearsals of the 1970 Census of Population and Housing: A Procedural History
No. 33. An Estimate of a Quasi-Stable Age-Sex Distribution for Ghana in 1960
No. 34. Investigation of Census Bureau Interviewer Characteristics, Performance, and Attitudes: A Summary
No. 35. Raw Materials in the United States Economy: 1900-1969
No. 36. Response Variance in the Current Population Survey
No. 37. Who's Home When
No. 38. Economic Censuses of the United States: Historical Development
No. 39. Population and Housing Inquiries in U.S. Decennial Censuses, 1790-1970
No. 40. Studies in Occupational and Industrial Classification

To receive further information or to order copies of these reports, contact the nearest district office of the Department of Commerce or write to--

SUBSCRIBER SERVICES SECTION (PUBLICATIONS)
SOCIAL AND ECONOMIC STATISTICS ADMINISTRATION
WASHINGTON, D.C. 20233